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REMOTE STORAGE

CLAY RECORD

Vol. XXVI. No. 1. CHICAGO, JANUARY 16, 1905. Semi-Monthly, $1.00 per Year
Single Copies, - 10 Cents

A BRIEF REPORT OF THE FIRST SESSION OF THE ILLINOIS CLAY-WORKERS' ASSOCIATION MEETING.

The twenty-seventh annual meeting of the Illinois Clay-Workers' Association was called to order by President Butterworth at 1:30 o'clock in the Elks' Auditorium at Champaign Jan. 10th. There were enrolled one hundred and nine members besides some twenty or thirty that did not join. The average membership for the last sixteen years would be less than sixty.

President Butterworth introduced the Hon. E. S. Swigart, mayor of Champaign, who spoke as follows:

MAYOR'S ADDRESS.

I am very glad to welcome this representative body of men who, I consider, have done more for the premanent up-building of our modern cities than any other class of men I can think of. I had supposed, when I was asked to talk in this welcome addess, that I was to kind of picture all the beauties of our city and make it appear so nice and so realistic that some few of you, if not all of you, would want to come here and locate, when my friend, Mr. Stipes, the local member of your organization, took me aside and said that I wanted to go a little slow on that; you were all friends of his; he wasn't looking for trouble—he was a real modern Russian, so to speak; he was a man of peace; he wasn't looking for trouble or opposition. As you know, he about controls it in these parts, and I am a little limited in the remarks that I can make.

But there are a few things that I might say about our town. In the first place, I haven't any set speech and don't think I am going to make a long one, because, when I look on your program I see that you have enough on it to have something good. You may be like the little girl who asked if she could have her mother make the prayer shorter. You have probably heard this before. "Make it like Nurse Mary's—the prayer she says every morning"—especially, I suppose, on such cold mornings as this was. "I don't know what that is," said her mother. "She says in the morning before she gets up, 'O Lord! must I get up!'" And that was a very appropriate and true one. Now, I will try to make my remarks short.

In having you come to the city, if this were your seventh instead of your twenty-seventh meeting, I think it would have been a mutual meeting, because we were all clay-workers at that time. That was before we had come into contact with the modern clay-worker, before he made the paving brick with which we could pave our streets, and we had about 60 miles of streets, and the mud a yard deep, and four thousand clay-workers. But at present we have only one—Mr. Stipes—and I am sure that he will give you a warm and hearty welcome. (Applause.) And while you are looking our city over we want you to feel at home. Above all things, don't go away until you see your University of Illinois, because we think that is the greatest thing we have. It is not ours, but yours.

Some of you who have a little time to go around will see other things besides the university. Some of our good people here go to church instead of going to a hotter place, and if you get around you will find that we have a good supply of well-built churches, and also one of the nicest and neatest kept set of school buildings and grounds in the State. You will see what we have built up here from your clay-workers. You have furnished the sinews and we the capital, and we have paved nearly one-third of the streets of our city in the last three years. We are sorry that the snow is on the ground so that we cannot take you out in the city and show you what nice, paved streets we have. Then, for the clay-workers from Indiana—and a great many of them are here today—some of you may want to see the social side; go down on Main street. You won't find bricks, but you will find rock and rye, and most everything that you are looking for. (Laughter.)

As I don't want to talk too much about the city, I will say a few words for our police department. Some of our good people think that the police are blind in one eye, and the police commissioners inform me that they have told them to put their best foot forward, but to keep theid bad eye next to you while you are our guests.

With these few remarks I want, on behalf of the city of Champaign, to extend to you a most hearty welcome, and wish for you a most pleasant and profitable meeting. (Applause.)

Following the hearty welcome of Mayor Swigart, President F. W. Butterworth of Danville delivered his annual address:

PRESIDENT'S ANNUAL ADDRESS.

Of all the numbers upon the programme of the Convention, I believe this is the only one to which you are doomed to listen year after year. It seems to be the only one that you cannot escape. It, like the Egyptians and the "bricks without straw" in the National Convention—is sure to crop out some time. The President finds about a year after he is elected he is like the Irishman, no matter whether he has anything to say or not, he had better say it.

Gentlemen, this is the 27th Annual Convention of the Clay Workers of the State of Illinois, and although my years are not sufficient to allow of very much retrospection, it seems pertinent to cast backward and review the changes in the craft during that time.

Starting at the clay pit, we see the entire process of clay manufacture revolutionized by the use of shale wherever accessible, and I believe that the introduction of this material has had more to do with improvements in the industry than many of us realize. The uniformity and great depth of these deposits have given a permanency of capital in clay industries that was usually lacking before, and this has encouraged experiments along the line of expensive appliances, the cost of which prohibited their use in surface clay.

Steam shovels for digging the raw material, locomotives, cars and hoisting engines for haulage have superseded the old spade clay cart. In the preparation of the material, grinding machinery of various kinds and pug mills have displaced the old tempering wheel and the moulding machinery of gigantic strength forces to the cut-off a stream of clay which, in some instances, is chopped into 240,000 bricks in eight hours. We accomplish in often but twenty-four hours' time the drying of the ware which our clay worker of 27 years ago was only too glad to do in a week, and the clay product is now ready for the kilns.

Up to this point the clay working industry has been revolu-

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tionized, changed neck, crop and body during the period in which this Association has been in existence, it being no uncommon sight to see the clay dug, hauled, pulverized, tempered, moulded and dried without having been touched but once by human hands; but from this point on, what have we done?

Gentlemen, Members of the Illinois Clay Workers' Association, are we not to do using the identical kilns in which our forefathers burned their ware? With but a few minor changes in distribution, the down draft kiln of 1905 is in all its vital points the same as the down draft kiln of 1878. We have reason to pat ourselves on the back upon the successful use of improved clay handling devices, but we have equally good reason to say either that there is room for improvement in the economical burning of clay products, or else take off our hats to those old fellows, who, twenty-seven years ago, founded this Association.

This lack of progress in the burning of our material was called home to me by a visit of a representative of the Swedish School of Ceramics, who visited our plant during the Exposition at St. Louis. It is incomprehensible to him that with the successful use in the older countries of improved methods in the burning of even the finest products of ceramic art, that we should still continue to use the old appliances discarded by them years ago. I firmly believe that the improvements in the industry will be made along these lines in the years to come, although I candidly confess that I want some other fellow to try it first.

During the life of this Association there has come into existence a new clay product which can be directly charged to the use of shale, and it certainly speaks well for the push and energy of those engaged in the manufacture of paving brick when it can be truthfully stated that within considerably less than this time this branch of the business has developed from nothing until during 1903 the total value of paving brick produced in the United States was $6,500,000. Of all the numberless varieties of clay products made today it can be truthfully stated that not one except this has any destructive influence to withstand except the disintegrating action of the weather. These brick have this to stand in its most exaggerated form, being always at the grade line, and in addition they are called upon to stand the very heaviest kind of abrasion, that of the concentrated traffic of the city streets. It seems almost impossible that such an article can be made from clay, yet no higher tribute can be paid to the pioneers in this line than to say that in nearly all of the medium-sized towns and many of the larger cities brick paving has no competitor.

That improvements in manufacturing appliances resulting in the more economical production of a better grade of clayware are going to continue, is well manifested by the attendance at all clay workers' conventions, prompted by a mutual desire to exchange ideas. Every clay worker is fully alive to the importance of a thorough knowledge of the raw material he is working, not only in its physical characteristics, but in its chemical properties. The most of us have served their apprenticeship in clay working and a mighty long and hard one it is; and even the oldest and most skillful of you will scarcely admit that you are past masters of the craft; that you have nothing more to learn.

I ask the clay workers of Illinois to think what it would have meant to them to have had that apprenticeship smoothed and shortened by an education in clay working in a college properly equipped, and what it would mean to them today to have a department in the University of Illinois partly under their direction for that purpose and for the purpose of making scientific investigations of knotty problems which are today puzzling our brains. I think I am right in saying that no college in the country today has the right to use a portion of the yearly appropriation for scientific research in clay working. We who are paying our portion of the expenses of the State can secure this department in the University if we go about it in the proper way, and tomorrow morning Professor Rolfe will tell you how. As President of the Association, and as an individual clay worker, I wish to particularly request your earnest attention to this matter and to ask that you each and every one put your shoulder to the wheel and help secure this appropriation. It is not right or fair that the younger members of the craft in the middle west should be deprived of the educational privileges accorded those on either side of them.

It seems a very fitting time in which to bring forward this matter as we have on our programme several papers prepared by members of the Faculty of this University, and I ask you to remember with gratitude that they will give to us gratuitously their time and the benefit of their knowledge and education. It appears to your President that we are particularly favored this year in this respect, and the sincere thanks of the convention are due to these men who will so generously contribute to the programme.

The business of the year just ended has been in the majority of cases fairly satisfactory to the manufacturer of clay products. The demand has not always been as brisk as could be, perhaps, desired, but considering the other influences bearing upon the country's condition, there is room for but little complaint. The general financial condition of the country warrants a prediction of prosperity for 1905.

The most disturbing element is in the paving brick business of the State of Illinois, caused by a recent decision of the Supreme Court upon the 1903 amendment to the improvement and special assessment law. This decision declaring unconstitutional this amendment allowing Boards of Local Improvement of medium-sized towns to originate work without petition from the property owners has unsettled the bond market and caused many towns to await a more stable condition before promoting new pavement. It seems that some united pressure from contractors, material men and bond-buyers should be brought to bear upon the powers that be to remedy this.

Now, gentlemen, I do not propose to take up any more of the time of this convention except to say that we are here as the representatives of an old and time-honored craft, manufacturing products which vary from the most valuable articles of decorative art down to the very cheapest manufactured products sold to-day, and that, although the raw we use is the very lowest in grade, and as common as dirt, that is all the more reason why we should be proud of our calling to make from that something which is either useful or ornamental.

The first paper on the program was that of "The Operating of Brick Plants by Electricity," by S. H. Alsip of Belleville, but on account of the election in this company he did not arrive in time and the paper was read by Mr. H. de Joannis of Chicago:

OPERATING OF BRICK PLANTS BY ELECTRICITY.

When our friend, Mr. Hartwell, asked me to write this paper, I stated I knew little or nothing about electricity, and thought surely would be excused on that account, but instead he came back at me with another proposition that I could not well refuse. There being no reasonable way out, I finally consented to make an endeavor to write a paper, and give my experience in operating a plant by electricity.

I notice that I am down on the programme for a paper entitled Operating Brick Plants by Electricity. As electricity is a subject I am not qualified to talk about, intelligently, all I can do is to give my experience in the erection and operating of a pressed brick plant run by electricity.

Shortly after organizing the Standard Brick Co., the question was brought up whether it would be advantageous to operate the plant by electricity. We secured the address of two firms who were operating their plants by electricity, namely, The Fairview Brick Co., Denver, Colo., and another firm whose address I have lost, and they very kindly assisted us all they could, besides obtaining all the information that was to be had from other sources. This was not of a very convincing nature, for the fact we did not find anyone who were operating under the same conditions, nor could state positively what the power would cost us. The company who furnishes the power made estimates of the cost to operate our plant by electricity, but would not give any guarantee to that effect.

However, with the limited amount of information at hand, we decided to use electricity for power, and in case it did not prove a success, we would view it in the same light as Mr. McGraw, "The Four-Year-Old" of Pittsburg, Pa., did. We would call it an experiment, and not a mistake.

The next question to solve was, how much power would be required to operate our plant? What surprised me most in seeking this information, there was no two persons whose opinions were alike on this subject; so was compelled to act according to my best judgment. We came to the conclusion that a 50 horse-power motor would be ample to operate a plant having two four-mould dry pressed brick machines, so a 50 horse-power General Electric motor was purchased. This cost, complete, with all the latest improved attachments, set up and ready to run, in the neighborhood of One Thousand Dollars.

Before buying the motor, we had under consideration the advisability of using a motor for each individual machine. This would have done away with all the shafting, pulleys and belting (excepting the elevator belt), and from the experience I have had, in addition to the information acquired from other sources since that time, believe it would have been the better way.

The plant was started June 1, 1903, and for the first couple of months the motor worked very nicely, even to the cost of the power coming below what was estimated. About the third or fourth month, I noticed that the motor commenced to spark a little, and as this did not occur at the beginning, I began to think something was wrong. I again went to work making inquiries and visited around where motors were in use, but got very little satisfaction. The sparking kept on increasing, and finally one set of the brushes began to wear away very rapidly. While my knowledge was very limited in this line, I knew there was something wrong that ought to be remedied. I went to see the head practical man of the company who furnishes the power, and prevailed upon him to come out and examine motor, but not until two other electricians had been out and failed. He said the commutator had become rough and uneven, and about the only remedy was to true up the commutator. This he kindly did in about an hour's time, and ever since then it has run as regular as clock work without the least bit of trouble.

Had we been given the proper instructions about taking care of motor when set, the above difficulty would never have happened. However, all this amounted to was a little annoyance.

I might say right here that I consider it a big oversight in the companies selling motors not to give more explicit instructions how to run and take care of them, when making a sale. The running of a motor is a very simple proposition, and anyone of ordinary intelligence can manage it successfully. The essential points to keep in view are: Have motor room as near dust proof as possible, although this is not absolutely necessary. The bearings being of a self-oiling type, it only needs oiling once every six or eight weeks, and then only about two quarts of a 40-cents per gallon grade of oil is required. When it is time to renew the oil, the oil from reservoir should be drawn off first. This old oil is still serviceable, and can be used on slower moving bearings.

The commutator is the part of the motor that needs the most attention; in fact, it is about the only part that requires daily attention. The commutator and brushes should be kept perfectly clean at all times. Neglect upon the part of the man in charge of the motor to keep commutator and brushes clean will soon cause trouble, as I found out from my own experience. Care should be taken to keep commutator smooth and avoid sparking as much as possible. This is accomplished by taking a piece of about No. 0 sand paper, fitted to a segment of wood with a radius equal to that of the commutator, and placing it on the face of commutator when running at full speed every morning. This is done to clean off face of commutator and keep it smooth. Next take a cloth and hold it to face of commutator until all foreign matter is removed, then wipe the commutator once in a while with a cloth coated lightly with vaseline. In lieu of vaseline, oil can be used sparingly. The above work does not require more than three minutes' time.

Our plant consists of a four-mould Berg Press, 42-inch Fernholtz Disintegrator, automatic clay feeder to disintegrator, and a clay mixer, both of our own construction. After operating plant for about a month an indicator gave the following results:

Running main shaft, four bearings, disintegrator, feeder, clay mixer and elevator without load required	10 h. p.
Running with load, the above machinery required an additional	5½ h. p.
Brick press, with load, required	3½ h. p.
Making a total of	19 h. p.

The cost of operating plant on the above basis, having a daily capacity of 21,000 brick, made out of a yellow surface clay, similar to St. Louis clays, which is of a mellow character, is $3.60 per day of ten hours, or 1 9-10 cents per hour for one horse-power. This includes the electric light used at night around the kilns, and wherever needed elsewhere.

I estimate the capacity of plant could be doubled with only about 50 per cent additional cost in the power, which, with us, would be cheaper than steam power. If plant was increased to three times its present capacity, it is my opinion there would be very little difference in the cost of steam and electric power.

The points in favor of electricity for power are:

It costs less to install.

Requires less space.

Is always ready.

No engineer or fireman needed.

No coal to contend with or ashes to dispose of.

No Sunday work cleaning out boilers.

Does away with torches and lamps, which give poor light and are a source of trouble and danger of fire.

Requires little or no attention.

Rate of insurance is less.

Ease of furnishing power to isolated places.

The only points against electricity for power, so far as I know of, is the burning out of motor by lightning striking the wire. This is so remote, however, it is hardly worth considering.

This subject is one that covers a large field, and one who has acquired a thorough knowledge of it could undoubtedly write a paper that would be very interesting and command the attention of those operating power plants. Electricity is a power that is now used in a great many different kinds of factories with perfect success, and it is only a question of time when it will be recognized as the ideal power for brick plants. I realize the little experience I have had with electricity does not qualify me to prepare a paper as it should be; however, I sincerely hope what little I have said may lead to a discussion that will be both valuable and entertaining to those of this convention.

Gentlemen, I thank you for your kind indulgence.

The President—Gentlemen: The question of the use of electricity in brick plants is a live topic; we would like to hear from some one in the convention who has had some experience and has something to say on the question.

Mr. Purington: Mr. Chairman, I don't like to take the initiative and go on the list in the way of leading the discussion, but I do want to throw in a word of warning to the brick-makers of Illinois, that they don't want to be carried away on this electricity problem. What is undoubtedly true at Mr. Alsip's plant, if put in Mr. Butterworth's plant, or others that we know of, would be an absolute failure. I think that is universally understood. I am like Mr. Aisip, I am no electrician and know very little about it. But the secret of Mr. Alsip's success, and there is no doubt he has made a success of it, is that the power is intermittent. It is off and on all the time. It is all right, as it is on the dry-press machine—about half the time it is doing work and half the time it is off.

Now, if you try to apply that same power to auger machines you are going to make as much of a failure in that application as Mr. Alsip has made a success in his. I am satisfied, from my taking the matter of electricity up more or less, that the theory is correct. For instance, we talked somewhat of putting our plant under electricity after the general manager had been out and visited Mr. Alsip's plant and made a report on it to me. And in going around with one of the brightest electrical minds I have ever run across, one of the managers of the Western Electrical Company—in going around the plant with him, I said, "Mr. Ferris, one of the things that we want to get rid of is running all this rope transmission." We were running them by rope transmission, and the rope was a good deal twisted. He said, "You run this from Monday morning to Saturday night—this rope transmission?" "Yes," I said, "and on the fans it is steady, all day and all night." He said, "I don't believe it is economy; I don't believe that you can put electricity in there and have any economy in its operation." In any place where the pull is constant and steady there is no economy in electricity. And I want to just tip a little word of warning to brickmakers who are contemplating electricity, that they want to take these matters into consideration before they spend very much money on it.

The President: Some few years ago we had some experience ourselves along that line. The question came up of using electricity and we had the same experience exactly that Mr. Purington had. We could not figure that we could save anything. I think that the secret of Mr. Alsip's success is that he gets his electricity from some outside power plant and does not have to generate it himself. Unquestionably, that would put a very different face on the matter. Is there anyone else on the question of electricity? If not, we will proceed with the program, "Drainage Suggestions for the Tile Manufacturer," by Prof. Fred S. Crane of the University of Illinois.

Prof. Crane: The conversation which has just occurred reminds me of a story. It was an organization which met in Detroit, and at that meeting there were a number of men from the different States, and they were talking about the different interests in the different States, and the man from New York told about the great State of New York, having in it the greatest city, which contained the greatest street—the money street of the world. The man from Ohio told about the great State of Ohio, having furnished a great many of the presidents of the United States, more than any other one State had. The man from Michigan told about the fruit interests and the lumber interests of Michigan. And the man from Indiana told about the great State of Indiana, and he said what he could for it; told about its being a great agricultural State, and he said, in closing that the people who came from Indiana were called Hoosiers, and that the word was derived from "huzzar," meaning "brave man." "And now," he said, "will the next gentleman, who comes from Illinois, tell us why all Illinois people are called "Suckers?" Clark E. Carr rose to the occasion and he said: "Mr. President and Toastmaster: I have listened with a great deal of attention to the men who have been talking; the man from New York has certainly presented his side well; the man from Ohio has interested us to the last degree, and the man from Michigan has done what he could. But the man from Indiana has certainly spoken well for that whole State, and I believe it, and all the people of Illinois believe it, and that is why we are called 'Suckers.' " (Continued laughter and applause.)

Now, what remarks I shall make in the course of my talk I hope you will believe. I am not old enough to have had long years of experience, but what few years of experience I have had in the drainage question in the State of Illinois, in connection with our experiment station, have been rather strenuous years, and I want to leave with you some of the suggestions, some of the things that have come under my observation.

DRAINAGE SUGGESTIONS FOR THE TILE MANUFACTURER.

Practice and theory are so closely related today that any business which would be successful must combine the two. When the speaker answered the kind invitation to present a paper before your Association, saying that he would speak upon "Practical Suggestions for the Tile Manufacturer," it was not with the thought that he might produce any new ideas, but rather that he might point out a few of the conditions which have come under his notice and suggest where the farmer and the manufacturer might be greatly benefited by a more aggressive spirit on the part of the tile maker.

So far as tile drainage itself is concerned, it is an old art, yet how vague are the ideas which the average user of tile has, regarding its true benefits. Many experiments are being carried on and have been in operation for years under the direction of the Agricultural Experiment Stations in the various states. Some of these have been drainage experiments, many follow other lines of work, but all are of an agricultural nature. The results of these experiments are published and, in so far as possible, are placed in the hands of those whom they are supposed to benefit. We have gone so far as to conduct experiments in certain localities, not only that we might learn existing conditions there, but that we might have an object lesson from which the people might benefit. It has followed naturally that benefits arise to every locality from such object lessons, and they are profitable even to those who are generally doubters. Thus by leading and demonstrating, a great good comes of the work.

The idea we would bring to your attention is that this is a kind of "show me" age, an age when demonstration is the rule and not the exception.

What relation has this to the tile manufacturer?

It is this: there is a large percent, no one can accurately estimate how much of the tile drainage done in times past that is not doing the work required of it, and many entire systems have been replaced. Some, because they were not started on a scale which would take care of the surplus water, and much from improper laying of the tile. This has hurt the tile business far greater than one would realize at first thought. In the past you, as tile manufacturers, had the tile for sale, and almost without exception, when sold, there your part of the transaction ended, and the consumer placed his tile as he saw fit. But the speaker believes that in the future you can well afford to go farther to the end that you are to have general supervision of the tile drainage for which you furnish the tile; the details of that supervision might vary according to locality, and according to the amount of tile purchased.

These suggestions have come from a close study of trade conditions today in which we find manufacturers in all lines going after the business, and their representatives cover the entire country. After they have sold their goods their interest does not cease, and their experts follow the field operations of their entire output. As a result, machinery companies are disposing of much more machinery than could otherwise be done.

How much of the tile sold by your factory has had the careful supervision of a competent engineer? Understand us, we do not say that to be an engineer one must have a degree from any college or university, but he must be a competent engineer who can figure to a mathematical certainty the fall of every 50 feet of his tile, and has some system of supervision which insures the laying of every tile on the proper grade line.

All of us have seen too much of the water level system, the plumb bob system, or any of those hit and miss systems, which have practically, if not entirely, destroyed the good effects of a large percent of drainage.

A ditcher who will not follow a system of levels given him is certainly not competent to follow his own system of hit and miss leveling.

The farmers are abreast of the times today and we do not hesitate to say that as a class they are among the best read people to be found in America. The farmer is a ready buyer only when he is convinced that advantages are sure to follow. Should you begin the systematic plan of canvassing the country in which you are operating, your representative will find ready listeners, for the leading farmers are aware of the benefits of a proper and systematic drainage, and where they lead, the others follow.

A tile manufacturer in Champaign County not long since said to the writer that they were not running their factory much now, because the land is nearly all drained out. I want to say that I firmly believe Champaign County could well afford to put in as many more tile as are already in place, and the returns from a competent system would justify the money expended. And this is in no wise a particular case, as is proven by a study of conditions in many parts of the state. And what applies to Illinois applies to similar soils in other sections.

You ask where are you to obtain this practical overseer of the work? You have him with you now, perhaps someone in your employ, who is competent to take hold of the work, or if not, one whom you can send to take one of the short practical courses now provided in our schools of higher learning where your representative could soon acquire the knowledge which would enable him to lay out and superintend any system of drainage.

The farmer, as a practical man, already appreciates the advantage of having a responsible party look after his drainage problems. He knows and appreciates his helplessness in the matter, and farther, he realizes that the wide field covered by the tile manufacturer gives him a wide knowledge of drainage conditions and its essential points.

What will this do for the tile manufacturer?

It will increase his business because it would increase the number of tile when a thorough systematic drainage is installed. By increasing the efficiency of the drainage, you have engineered, you cause the farmer to reap greater benefits than ever before, and his confidence in your business is doubly assured. We hear much of our rich soil of Illinois; true, it is rich, and it has been reclaimed by tile drainage. But my suggestion would be, there is room for a duplication of what is already accomplished in the way of drainage; the farmer is willing; the money is at hand. Urge the business, but in so doing, remember your duty does not cease until the tile are covered in the field.

The President: We would like to hear from Mr. L. P. Whitney of the National Drain Tile Co.

Mr. Whitney: Mr. President, I did not come over here with any set speech; I came here merely to listen, more as a visitor than anything else. I thank you very much, but I haven't anything to offer at this time.

The President: Mr. Blackburn of Paris.

Mr. de Joannis: Mr. Blackburn has some figures on drains that he has been making that would be interesting.

The President: Mr. Blackburn, will you favor us?

Mr. Blackburn: I am like Mr. Whitney—I came here as a spectator only. I did not expect to be called upon. What I may say would be in part of the clay-worker's interests. I have been on that side of the fence always. I superintended and put in quite a large amount of their stock. I find that, just as the professor has said, there has been a great deal of misappropriation of funds. Men have set their tiles in fields and farms, have set their tiles in the ground, and today the younger members are taking them out and are reconstructing them.

I had this year a little experience which is instructive. I have charge now of a tract of land belonging to a gentleman in California. He had been getting as a rental one dollar an acre for 640 acres. After the taxes had been paid it would net him about 50 cents an acre. I took charge of that land about two years ago. I put 17 miles of tiles in 640 acres. It was very flat, level land. For this year I got a rental of $14 an acre, $8,454. I sent him a draft for $7,500. He wrote me back that he didn't want to sell me his land, and he didn't want me to rob my farmer friends. He was very much delighted with the income from the land, and I yet feel that I haven't that land thoroughly tiled. The manner of thoroughly tiling a piece of land is to do it systematically. You can't just take off what water you can see, but must take the water off so that all the water that falls, or nearly all of it, 40 per cent or 50 per cent of it, will go to the soil and filter through your land to the tile. That is, instead of washing off your soil, it will be gathered to the land.

I have a place in Edgar county, where for 10 years it has been cultivated. This year 180 acres of that land—and I attribute it to the thorough tiling—produced 62 bushels on an average of corn. My neighbors should have their land as well tiled as mine, but I suppose that I have been considered sort of a crank on the tile proposition—their corn has averaged from 35 to 40 bushels on land that has been farmed about the same length of time that mine has.

It is necessary that all of the land be thoroughly tiled, and we are just beginners. I was talking with Mr. Whitney about tiling—we are just beginners. We tile the low lands and think we have done a good deal. We allow the drainage of our higher lands to merely inundate the low lands and tax their drainage. But it is necessary to tile the rolling lands at any rate.

The tile is being well made. I have no trouble in getting tile. I think the tile-workers are doing remarkably well, but, as the professor has said, we should act with the farmers, so that they will get the use of the tile. It does not do any good to make a whole lot of brick and let them lay around, but the farmer puts in the tile too often without knowing just how to use it. State your locality, state your outlook, state the character of your soil. The depth at which they are to be put in is just as important as to have a good article laid in the ground.

The next paper on the program was the "Selection and Care of Machinery," by Davis Brown and Charles Burridge of Tecumseh, Mich. Mr. Burridge read it as follows:

THE SELECTION AND CARE OF MACHINERY.

The discussion of such a subject as this, under the circumstances which surround us here, is necessarily limited, not only by the amount of time it deserves in proportion to other parts of the program, but for the reason that we believe it would be entirely improper at this time for anyone to take up details of machinery design and construction which would involve any particular manufacturer. It also seems to us that the care of machinery is something which all of you who handle the practical end of clay-working, know all about; or, on the other hand, something which those of you who handle the business end of the establishment care nothing about as long as someone else looks after it properly. There are, however, a great many ideas in reference to these subjects which will bear repetition and discussion, but it will be necessary for us to confine ourselves to general points which cover a majority of cases.

We assume that we are to treat of machinery selection for permanent installation, and that there is a determination upon the part of the builder to put up a first-class plant for the manufacture of first-class ware at the lowest possible cost for labor, fuel and maintenance. We take for granted that, to a great extent at least, the first cost of proper machinery is a secondary consideration, and that a good plant, capable of running 10 hours per day, practically the year around, is the subject we are to discuss. In the selection of machinery for such purposes we have two distinct classes to deal with; that is, we have the power and power transmission devices and the clay working machinery. The first mentioned class we may subdivide as follows, viz.: boilers, heaters, pumps, tanks, engines, belts, pulleys, shafting and hangers.

BOILERS:—In the selection of boilers the first point to be decided is the size, and here exists an opportunity to save a little in first cost, to be lost many times over in the long run, for a boiler which will not make steam fast enough, fires hard and requires much more fuel for the same amount of work, than one somewhat larger than necessary. A safe rule to follow is to install boilers the properly rate horsepower of which is 25 per cent in excess of the horsepower of the engines. This applies, of course, only to the boilers for power purposes, and bears no relation to the steam requirements of dryers or other auxiliary apparatus. Size having been determined, the type of the boiler is the next point in the selection, but the plain horizontal tubular pattern is so practically standard for our work that little need be said about it. Recent practice, however, eliminates the usual steam dome and substitutes the dry pipe, with a result of some saving and some increase in strength; and it is also now more genarally considered economical to install a boiler capable of maintaining 125 pounds' working pressure. This feature makes the boiler cost more than one for low pressure operation, but the difference is made up by the saving in fuel. In connection with the boiler it may be well to give a little consideration to the stack. Comparison with good authorities show that usual stack dimensions are based upon the consumption of 5 pounds of coal per horsepower hour, and while this is perfectly safe when good coal is to be used, or when sufficient surplus boiler capacity is employed, there are coals in almost every locality which can be had at a low price, and which can be used with economy if sufficient draft is available; therefore, the selection of liberal stack specifications is, as a general rule, a good investment. The rocker, or shaking, grate is also of considerable assistance in the use of low-priced fuel, and under a great many circumstances will, in a short time, save more than the small excess of its cost when compared with ordinary furnace equipment.

HEATERS:—It hardly seems necessary to state that the temperature of the feed water should be raised through the agency of the exhaust steam by means of a heater; but we have seen many, especially small plants, from which the exhaust was issuing vigorously and radiating good expansive heat units to the surrounding atmosphere without a cent's worth of benefit to anything or anyone. Such practice is no more or less than throwing money away, and in a considerable amount, too, in the course of a year. There are numerous types of heaters on the market, but the plain open pattern seems best adapted to such work as ours. In its operation the water enters at the top with the stream broken up as much as possible, so that it will readily absorb the heat from the exhaust steam which is brought in contact with it. This process not only heats the feed water and removes some of the impurities from it, but condenses the greater proportion of the exhaust itself. The central portion of the heater should contain deposit plates and provisions for the introduction of straw or excelsior to further assist in the purification, and the lower portion should be a hot water reservoir to which the pump is connected. Perhaps it will not be out of place here to deviate from our subject somewhat and mention a point frequently disregarded in connection with heaters. They should be set at least two fet above the pump in order that the latter may be able to handle the feed water at as high a temperature as the exhaust is capable of maintaining it.

PUMPS:—For boiler feeding an independent steam pump should be selected with particular precaution to get a pattern which can be throttled down to a very low speed without danger of stopping on the centers. If the plant is a large one it would be better to install two pumps so that operations may be maintained if necessary while making repairs upon one of them. For supplying the tank with water from the well, a steam jet is preferable when the water line is no more than 20 feet below the ground level, but for greater lifts a deep well pump should be employed.

TANKS:—A good cypress wood tank should be selected in preference to native wood or metal. Its capacity should be equal to twice that of the boiler it is to serve, so that after having washed out the boiler there is still enough water remaining to refill and last until there is steam enough to run the pump.

ENGINES:—The size of engine required depends, of course, upon the amount of machinery to be operated, and the only hard and fast rule to be observed in the selection is to be sure and get one large enough. If the clay working machinery and its arrangement have been settled upon, it is quite an easy matter to estimate the amount of power required to drive it by using as a guide the dimensions of the pulleys upon the different machines, assuming that the manufacturer provides the proper size pulley for the speed specified. A simple "rule of thumb," which may be safely used in such cases to determine the horsepower which any given pulley will transmit, is to multiply the circumference in feet by the number of revolutions per minute; multiply the product thus arising by the width of face in inches, and divide by 700. This simple computation will give the amount of power to drive each machine, and the sum of the requirements of all the machines, with 25 per cent added for the transmission devices, will give a perfectly safe figure upon which to establish the size of the engine. When less than 100 h. p. is required, a plain, slide-valve, medium-speed, throttling engine should be installed. Medium speed is specified for the reason that under these circumstances less skilled attendance is required than would be the case with a high speed engine, and at the same time assuring a more economical use of steam than would be the case with low speed. When over 100 h. p: is required a corliss engine should be installed, and in either case the specifications should be such that they provide weight and strength enough to work under a pressure of 125 pounds per square inch.

BELTS, ETC.:—In cases where both driving and driven pulleys are 48 inches or over in diameter, and have a belt speed not exceeding 2,500 feet per minute, a good grade of stitched canvas belting affords an opportunity for legitimate saving; but for smaller pulleys, or greater belt speed, a good grade of leather belt is preferable. Pulleys should have metal hubs and spokes, and wood rims; should be well balanced and attached to the shaft with keys, avoiding the set screw method. The bearings for the line shaft should be of the ball-and-socket, self-oiling, pillow-block pattern, set upon piers built up from solid ground. The shafting should be perfectly straight before being placed in the bearings, especial precaution being exercised in this regard if any keyways have been cut in the shaft after it left the shop.

The selection of the clay working machinery for a plant of unknown situation, to handle an unknown material, demands even more generalizing than does the selection of the power; but we may roughly classify these appliances as follows, viz., Transporting, Preparing, Moulding and Cutting Machinery.

TRANSPORTING MACHINERY:—The transporting machinery in general practice resolves itself into friction hoists, cable and cars; the principal points to be observed in the selection of them being strength, ease and cost of replacing parts subject to wear; and in reference to the cable, its flexibility. The size, or capacity, and number of cars required, depends so much upon the size of the plant and the necessary distance of transportation that it is impossible to give definite figures, but we believe that we prefer 1½-yard side-dump cars to any other style whenever the arrangement of the plant can be conveniently made to accommodate them.

PREPARING MACHINERY:—When clay or plastic shale is to be used a granulator is of great service, whether there is much granulating to be done or not, as it affords a sort of reservoir into which a whole carload of clay may be dumped at once. In addition to this the granulator assures a practically even feed for the crusher or disintegrator below it, and also reduces the large lumps of clay, if such are present, so that they are readily passed by the reducing machines. Aside from the usual necessary feature of strength the granulator should have a hopper of large capacity, means for adjusting the pitch of the knives to regulate and maintain the quantity of the discharge, and convenient means for starting and stopping.

For the purpose of reducing lumps and either separating or reducing stones, the market affords crushers, or rolls, and disintegrators. If conditions require fine grinding, the smooth roll crusher is preferable; its design to be such that one roll is driven at a greater speed than the other, or if combined, features of fine grinding and separation are required, the conical smooth roll crusher should be installed. For ordinary grinding and separation the right and left threaded roll crusher has points in its favor, and for tearing up tough lumps of clay the disintegrator is excellent. There are occasions which demand a combination of reducing machines; that is, a disintegrator or stone separator above and fine grinding rolls below, both being built in one frame. If such a combination is necessary the selection should certainly be in favor of the compound machine. In the selection of reducing machines generally, favor should be given to those in which the wearing parts can be replaced quickly and at small expense. Smooth rolls should be provided with scrapers, and the cutting rolls of disintegrators should be of such pattern that the bars, knives, or other parts which do the work, can be set out and reversed. Precaution should be observed to avoid the selection of any pattern in which there is any liability whatever of choking up, and to install those machines which are free from ledges or brackets, liable to cause the accumulation of clay. In addition to these, there are, of course, the major items of ample strength and immediate control, which apply to everything about the plant.

The pug mill fills the primary function of a tempering machine, but it also brings about other results quite as important; therefore, when considering a choice of patterns all of those points must be brought into the proposition. Like the granulator, the pug mill acts as a reservoir, and furnishes clay to the moulding machine at times when the supply is temporarily withheld; it also assists in mixing when two or more kinds of material are being used, and serves the purpose of a conveyor between the reducing and moulding machines. Its knives should be readily adjusted to different pitches; its length should not be greater than 14 feet; its bearings should be located so as to be free from accumulation of clay, and its driving arrangement such that it can be stopped and started instantly. The design should allow the removal and attachment of knives without disturbing the shaft or bearings, and the shaft should be of such dimensions that there is no possibility of sagging or springing at the center.

If the material to be worked is a hard shale the granulator, crusher and disintegrator do not enter into the proposition, but we have to consider instead dry-pans, elevators and screens. The iron frame, 9-foot dry-pan, is the one most frequently selected in modern practice, and for details of modern construction the following points should be observed. The weight should be about 16 tons, properly distributed to absorb the blows of the mullers and make the machine practically free from vibration. The bearings of the mullers should be bushed and of the so-called dust proof type. The tires of the mullers should be of white iron, 5 inches thick. The wearing plates should be of white iron, 2½ inches thick, and imbedded in lead or sulphur. The screen plates should be of heavy, perforated metal or malleable iron. The step bearing should be of such pattern that the wearing parts may be removed and replaced without disturbing the heavier parts of the machine.

Elevator specifications should cover the endless chain and cup variety with a wood box boot. Cups should be of pressed steel or malleable iron, disposed about 15 inches apart upon two sprocket chains. The boot should be of wood and of such pattern that it will eliminate the possibility of choking as much as possible, and at the same time be readily opened and closed should choking occur.

For dry material a plain gravity screen might be selected with legitimate saving, but dry material at all times is seldom a condition, and therefore some mechanical means must be provided to jar loose the moist particles. For material that is usually damp a self-cleaning steam heated screen should be specified.

MOULDING MACHINERY:—This portion of the subject is especially difficult to discuss without making direct statements, favorable or otherwise, to some particular manufacturer, but we may perhaps analyze the modern patterns of stiff-mud machines without going too much in detail. We have in an ordinary auger machine the following general features, viz., the frame, the gearing, the expressing screw or auger and the die. The frame should be cast in one piece, and, of course, ample in weight and strength, involving proper distribution of metal and journals, the length of which are not less than 2½ times the diameter of the shaft. The gearing should be made from a grade of iron possessing both greater hardness and toughness than ordinary foundry iron, and should be moulded with even density of sand around all parts of the pattern to avoid distorted or swollen teeth. The expressing screws, or augers, should be made of white iron or chilled iron, of such diameter and pitch in proportion to the work to be done, that they work clear down to the hub; with a preference for the single pitch style, particularly in the rear position whenever it is possible to use it. The die specification may be generalized by the statements that the least possible distance between the back of the die and the front of it, and the least possible difference between the size and shape of the front of the die and the size and shape of the back of it, and the least possible distance between the die and the expressing screw, are desirable in the production of the best ware and the production of the greatest possible amount of ware with a given amount of power. The die should also be of some hard material for durability, and particularly in the case of side cut dies there should be provisions for the lubrication of those portions of the column which are subject to the most friction while issuing.

CUTTING MACHINERY:—It is hardly necessary to say that automatic cutters are now almost universally considered profitable investments, even in quite small plants. The market affords many patterns, but some of them differ materially in form, and a selection, even of form, would be improper here. It would be safe to say, however, that all automatic clay working machines should be simple, of as few parts as possible, and of such mechanical design that all movements are easy and free from jerk or apparent strain.

THE CARE OF MACHINERY is identical with the care of anything else, and does not involve much more than ordinary judgment and attention. It is surprising, however, to note the great difference between clay workers in this matter. Some are always having something to fix when they would rather be running, and others use practically no repairs at all, and do all their maintenance work at a predetermined time. We do not mean to say that accidents can always be avoided, but it is true that proper care of the machinery and appliances about the plant will prevent a great many of them which would be otherwise inevitable.

WASHING OUT BOILERS:—It is impossible to say how often boilers should be washed out, but they should be kept free from sediment and scale, both of which are nonconductors of heat and cause greater fuel consumption than necessary, and both of which are an early cause of burn sheets and leaks. Sediment should be prevented as much as possible by rough filtration of the water through the heater, and scale should be prevented by the use of a suitable boiler compound, the nature of which must be according to the nature of the impurities in the feed water. Boiler insurance is a good thing to prevent improper care of steam boilers, for it involves a periodical internal and external inspection of the apparatus by a competent person who has no other interests than to keep the plant in proper shape. In the smaller plants which are shut down for quite a period during the winter months it is a good idea to cover the interior of the boiler with a coating of oil. This may be done by filling full of water, warming up thoroughly, introducing about two gallons of machine oil, and while still warm allow the water and surplus oil to run out through the blow-off.

CARE OF THE ENGINE:—It is impossible to properly care for an engine without keeping it clean, and it costs no more to keep it wiped up than it does to allow grease and grit to accumulate. Good oil is essential, but a flood of it is waste; and good sight feed cups, carefully adjusted, will do more to maintain proper lubrication and to keep down oil and repair bills than anything else of the same cost. An adjustable force feed grease cup is a good thing for the crank bearing; and a good sight feed lubricator, with an accessory hand pump, is necessary for cylinder lubrication. The kind of cylinder oil to be used depends upon the pressure. It will not take an ordinary clever engine driver long to tell whether his cylinder is properly lubricated or not, and he should be provided with what he needs. A good engine should run without noise when bearings are ordinarily tight and valves properly set, and plenty of hear work with as little monkey wrench as possible makes a good man around the engine room. When the engine is shut down for the winter, it should be thoroughly greased and the pipes thoroughly drained, everything carefully examined for wear, and arrangements made for such repairs as seem necessary. Before leaving, all valves and cocks should be tightly closed to exclude the air.

THE BELTS, PULLEYS, AND LINE SHAFT should not be left to care for themselves. If a belt appears to slip a little some day when the clay happens to get a little stiff, have it attended to that night, and don't wait until it is necessary to shut down and fit it. Have pulleys inspected occasionally for the purpose of locating and correcting any which may be working loose, and put a level on the line shaft once in a while to see if it is straight. It takes power and coal to pull a crooked shaft, and coal costs money. Save it.

THE CLAY WORKING MACHINERY needs daily attention to insure proper lubrication and conditioning. A light crowbar, kept conveniently at hand, should be daily applied to the shafts of the different machines to see that they are snug in their boxes, and whenever they show to be loose arrangements should be immediately made for taking up the wear by rebabbitting or otherwise, as the case may require. At any rate, fix it at once, and don't leave it. When the output commences to drop off a little with no other apparent cause it is safe to believe that the knives and expressing screws are worn. Get out your pencil and figure how long you can afford to wait until you put on new ones. Keep duplicate wearing parts on hand—a full set ahead—and whenever the set is broken, fill it out. This is cheaper than telegrams and express charges for one thing, and allows the continuous operation of the plant for another. Either is sufficient to make the practice profitable.

To sum the whole subject up in a few words: Select good machinery; pay all it is worth, but not a dollar more. When you get it take care of it as you would a good horse; watch it every day, and make your repairs before the necessity of them shuts you down.

The President: The paper deals with a matter of vital interest to all of us, the care of machinery. We would like to hear from someone on that question. Will Mr. Frazier of Chambers Bros. discuss this and start it?

Mr. Frazier: Mr. President, I can say that I heartily concur in that paper. It fits me to a "T." I think we ought to pay close attention to the repair of all machinery on the brick yard. From my standpoint, he has covered the subject well.

The President: We happen to use Chambers machinery. Judging from the size of some of Chambers' bills for repairs, it seems to us that it is rather important that we do take care of it. (Laughter.) I don't think, though, that they are any larger than any other manufacturer's.

Mr. Gledhill: That part of it, I think, was good; get good machinery; pay all for it that it is worth, and then take good care of it. (Laughter and applause.)

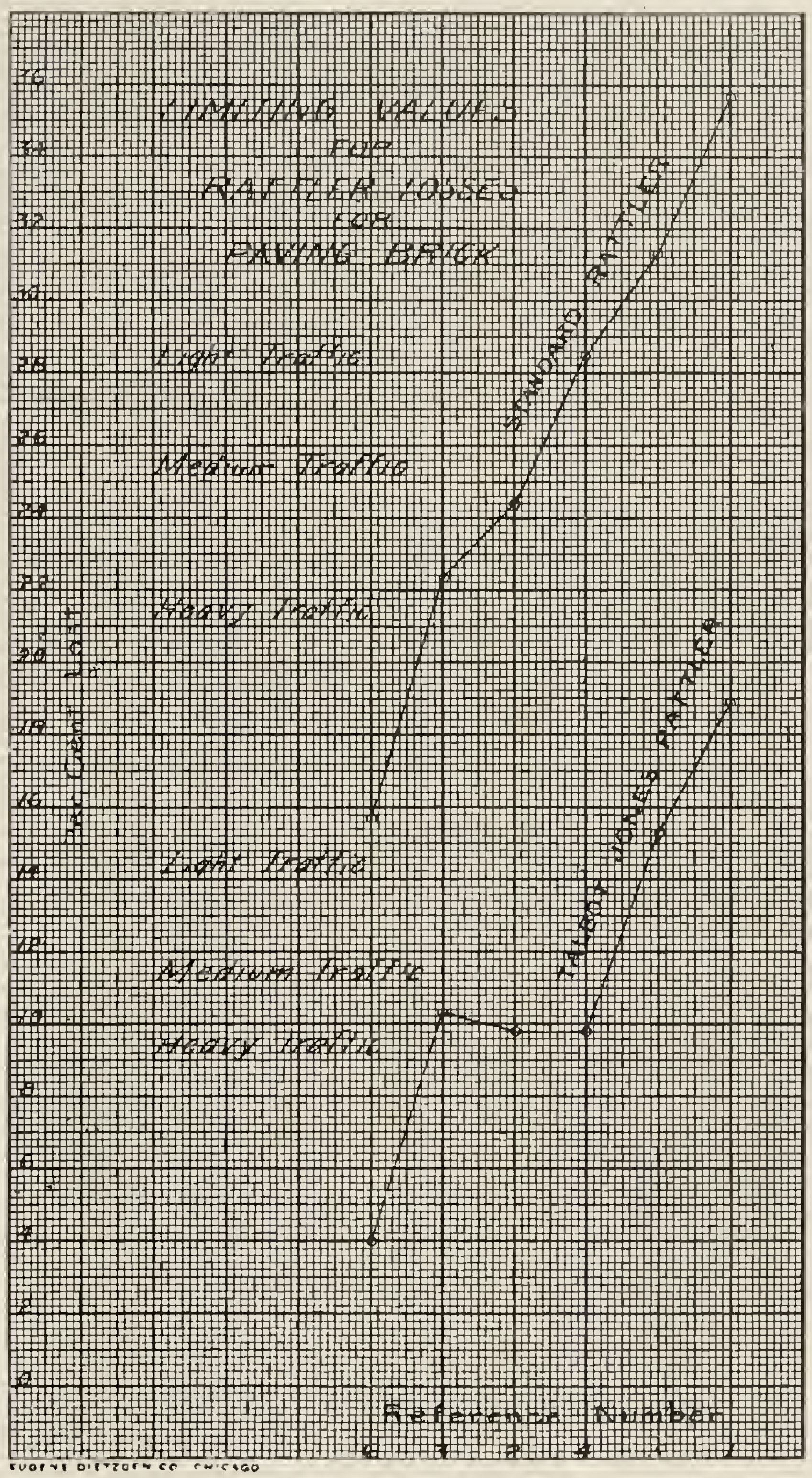
The President: I think that in the life of the brick manufacturers or clay-workers associations of the United States that there have been very few things done of more benefit, particularly to the paving brick manufacturers, than the adoption of a uniform test for paving brick. This was taken up several years ago in the National Association, and Prof. A. N. Talbot of the University of Illinois at Urbana was a member of the committee which made the investigation and which recommended that test. He has been instrumental in testing paving brick for a great many years, and I think we are particularly fortunate in having him today give us a paper on paving brick testing and inspection.

PAVING BRICK, TESTING AND INSPECTION.

The feeling is sometimes apparent, possibly not openly stated but at least implied, in the attitude of the parties, that the engineer in charge of public improvements and the contractor doing the work are necessarily natural enemies, and that the contractor considers the engineer as something like a necessary evil which ought to be abated or at least to be mitigated as far as possible. The writer does not believe this is a proper view of the situation, and thinks that a fair consideration of the matter would serve to clear up many misunderstandings. It is in this spirit that the following remarks are given:

Most specifications for materials set forth qualities of materials to be furnished by the producer to the consumer. In the case of brick pavements the producer, *i. e.*, the manufacturer and the consumer, who is the municipality and property owner, as represented by the municipal administrative officers, are to use certain requirements to define the material to be put into the pavement. Some of the purposes of these requirements and tests may be expressed as follows:

1. To make a basis or definition of what is wanted and what is to be furnished. This is the commonly accepted purpose of such requirements and tests.
2. To enable the city to secure material which will be as serviceable as other material which has passed the requirements and which has stood the test of traffic and time. This makes in a sense the tests a guaranty of quality.
3. To enable comparisons to be made between the products offered. It is quite possible that tests may show that a given brick is above the requirements, or that a slight difference in price is made up many times by the superior quality of the article.
4. To improve the general quality of the product put on the market. One need instance only structural steel and paints and oils to show improvement in quality following carefully made requirements and tests to show the beneficial influence of adequate inspection and tests.
5. To safeguard the interests of the public and of the taxpayer. The Illinois law requires, and rightfully, too, that the nature and quality of the improvement shall be explicitly stated, and evidently intends that the taxpayer may be able to determine (1) what the improvement is to be, and (2) whether it is being put in as described.
6. To enable control to be exercised over incapable or dishonest contractors or city officials, and to restrain careless or inefficient employees, or men who may have a mistaken notion of what their employer's interests are.
7. To educate producer, consumer, and their agents, in the qualities needed in paving brick,—from the manufacturer and the contractor and their employees to the mayor, the engineer, and the inspector.



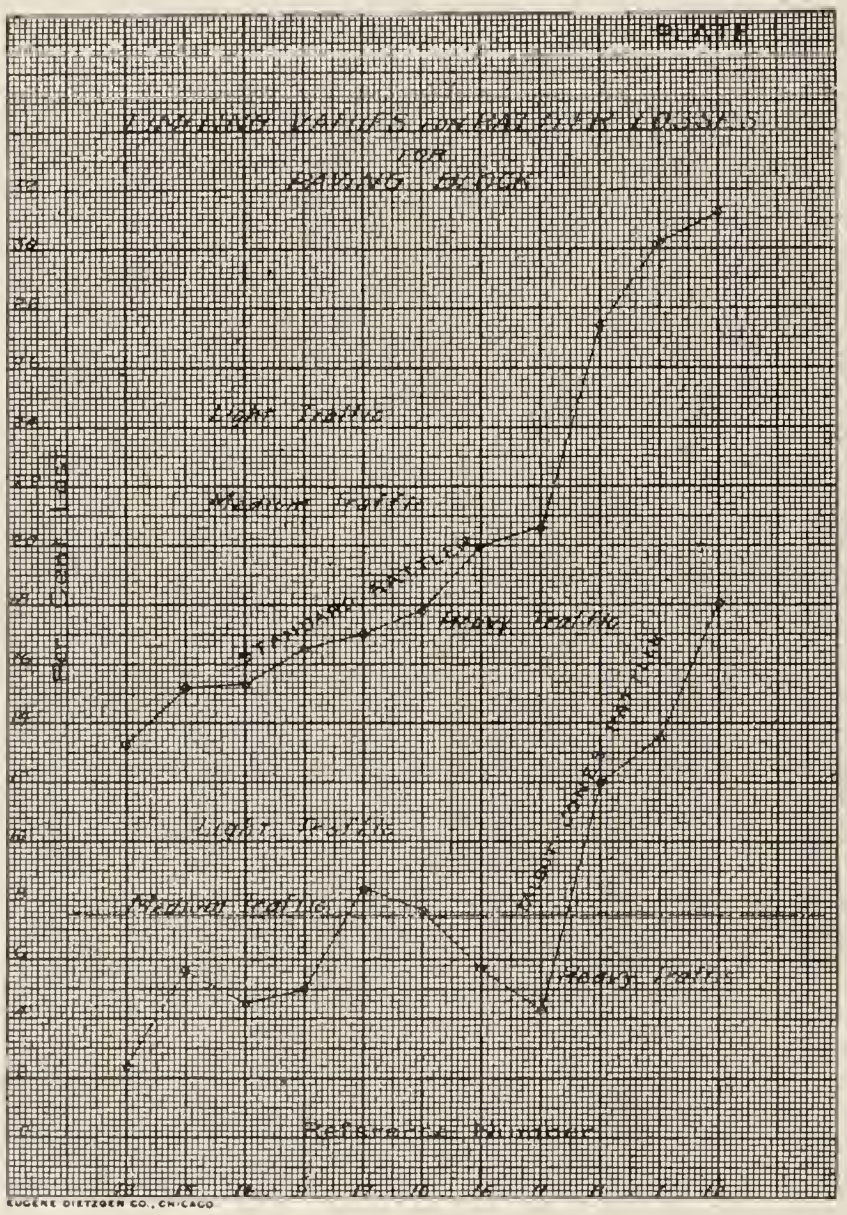
It is appreciated that the items enumerated overlap one another somewhat and that not all of them are in evidence on every piece of work. Included in them, however, are such important results as giving the opportunity for all bids to be made on the same basis, and for the bidder to fix his price according to the quality of the article wanted, and to facilitate fair competition.

It is not easy to formulate a statement of the qualities for paving brick, but in a general way it may be said that the following properties are wanted: 1. Toughness and hardness. 2. Uniformity of quality throughout a given lot of brick. 3. Homogeneity of structure and freedom from laminations. 4. Weather-resisting quality. 5. Regularity in form and size. It will be noticed that uniformity of quality has been put second. It is hardly secondary to toughness and hardness, and it seems to the writer that its importance is not generally sufficiently recognized.

There will probably be little difference in opinion concerning what qualities are desirable in paving brick. How to define these qualities, how to make tests to determine whether the required properties are present, and how to make an inspection which will extend this examination to the whole of the brick put into the pavement are problems involving many difficulties. At the outset it must be understood that such tests and inspection must, by the very nature of things, be imperfect and somewhat uncertain, and that the work will be on a different basis from the testing and inspection of steel, for example. This does not argue for the omission of such requirements and does not lessen the need for standards of acceptance other than the opinion of some one man, but the tests and inspection must be judged, keeping in mind their inherent imperfections. In selecting tests it must be borne in mind that the test may be far away from any actual and practical service to which the brick may be subjected in the pavement. An approach to conditions of wear in the street is desirable, since such a test will appeal to the amateur as reasonable, but this is not essential. The test of toughness in steel, for illustration, is the cold bend test (bending flat while cold), and also a specified stretch when tested to destruction, neither of which is at all similar to the conditions the metal will be subjected to. The object of tests is to determine whether the desired properties exist in the brick.

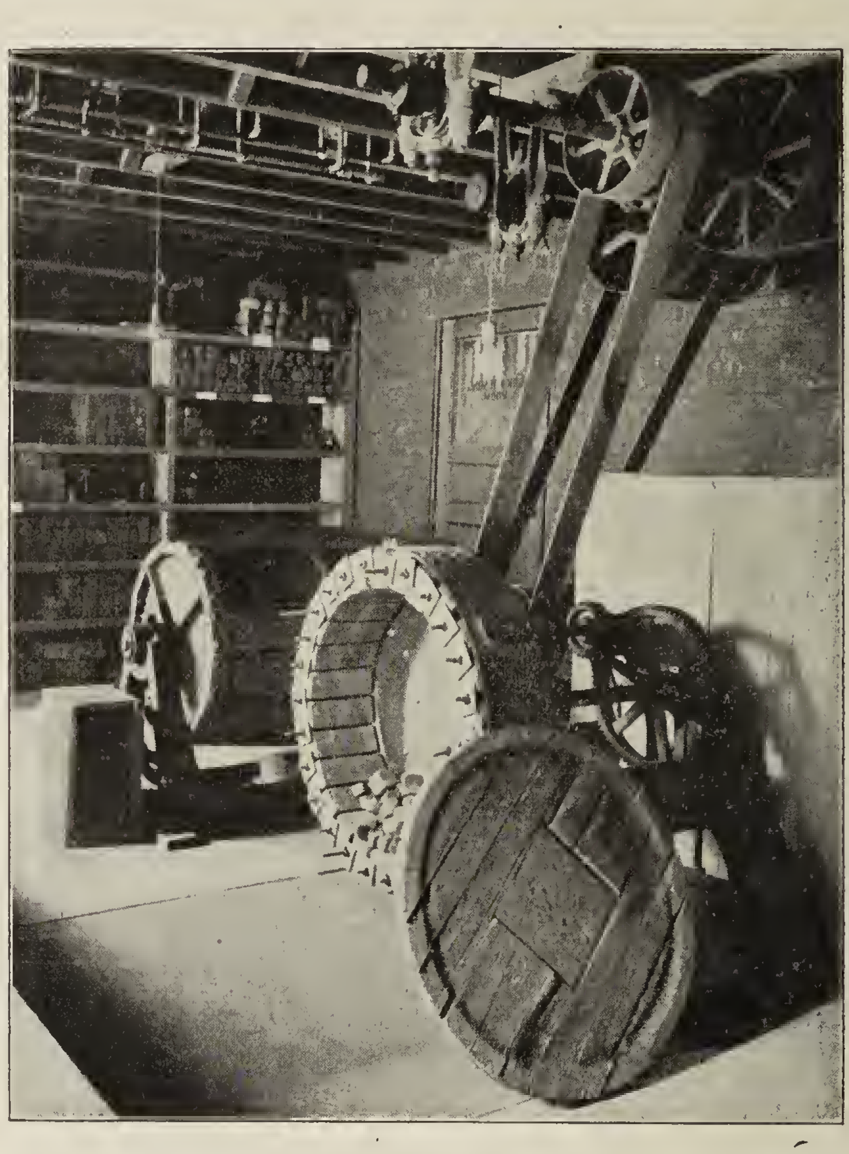
It will not be expected that this paper will go into the technical features of brick testing very deeply. Some of the principal methods will be considered and brief references made to requirement for different grades of brick.

Absorption Test.—The writer some time ago called attention to the advantage which the absorption test has for many makes of brick in giving an easy way of determining underburned brick, and also to the fact that for many makes of brick there is so very little difference in absorptive capacity between the good brick and overburned brick that this test fails entirely in this respect. He also called attention to the fact that while no general requirements for absorption covering all makes of brick may be made, and hence, that general limits of absorption are improper in specifications, yet for a brick from a given yard the absorption test may serve a useful purpose. It was also suggested that the limits of absorption may be set by extending the range a specified amount beyond the amount absorbed by samples at the time of the letting. The absorption test gives information concerning brick, but the requirements formerly current in specifications were misleading and are without value.



Crushing and Cross-breaking Tests.—Crushing and cross-breaking tests give valuable information about paving brick, and are of especial value when a study is being made of the best treatment to give a certain shale to get best results, or in otherwise making comparison between bricks or methods of manufacture. As a requirement in specifications these tests are not so useful. Generally, any fair paving brick will stand the usual requirements. Where facilities for making the cross-bending test are available, this test may well be included in the requirements, for it gives another indication of the properties of the brick. The crushing test is more difficult to make, and the information obtained in the cross-bending test throws light on the crushing strength.

The N. B. M. A. Rattler Test.—The old N. B. M. A. Rattler Test was an unfortunate selection. In some cases soft brick rejected at the yards gave better indications than a good quality of brick. The test was adopted without including any but high grade brick in the investigations. The N. B. M. A. standard rattler test, adopted in 1900, is a great improvement, but even this test has its limitations. It has the merit of being simple, expeditious, and inexpensive. The writer has never considered it to be an ideal test; it lacks in definiteness, uniformity, and perspective. For a given make of brick there may be too little difference in results between the indifferent brick and the good article. The accidents of testing cover too wide a range. The tests do not always permit a sound comparison of the merits of different brick, glazing, form, excessive impact, and other causes interfering somewhat with correct conclusions. And yet the test is probably the best now available. It is especially serviceable in helping an inspector to judge the quality of the different grades of brick which come from any yard, and to help him form his judgment of their quality. It makes a reasonably good guide to settle whether brick come up to the standard imposed by an ordinance for a given improvement.



The Talbot-Jones Rattler Test.—In the so-called Talbot-Jones machine the brick are clamped around the circumference of a circle, themselves forming the drum of the machine on which the shot roll and tumble. The conditions more nearly approach the conditions of street pavement. This machine is still in the experimental stage, but it promises well. Brick taken from street pavement where they have seen severe service wear in this machine so that the opposite face is remarkably like that which has received the street wear. Tests with this machine require more time than is taken by the N. B. M. A. rattler. The mixture and charge of shot used and the speed and number of revolutions selected were decided upon after several series of tests had been made with different grades and different makes of brick, and after studying the relative amount of chipping and abrasion under a variety of conditions, and watching the action of the shot through the screen used as the head of the drum. With the present device the brick are set too far apart, the brick are not supported well enough laterally, and the shot may, by reason of varying thickness of brick or varying shape of corners, or varying degrees of smoothness of surface, be carried to different heights before tumbling, and thus give losses which are not comparable. Yet the results with different grades of brick are satisfactory, and comparisons of different makes of brick, whose quality is apparent, are in general more satisfactory than those made with results from the standard rattler. Construction is now in progress of a head and drum which will permit an adjustment of the circumference to hold an integral number of brick evenly and closely spaced, with fillers between the brick, and with a device to restrain the shot from rising beyond a certain height. It is hoped that this arrangement will eliminate the imperfections found in the present machine, and that tests made with the improved machine will prove satisfactory all around.

Requirements for Tests.—The appended diagram gives values of the upper limit of rattler losses for three grades of paving brick and block, which may be termed: 1. Heavy traffic. 2. Medium traffic. 3. Light traffic, for both the N. B. M. A. standard rattler and the present Talbot-Jones rattler. These limiting values are for the standard rattler for the usual size block: Heavy traffic, 17 per cent; Medium traffic, 21 per cent; Light traffic, 24 per cent. For brick size: Heavy traffic, 21 per cent; Medium traffic, 25 per cent; Light traffic, 28 per cent. For the present Talbot-Jones machine, the limiting values are for block: Heavy traffic, 5 per cent; Medium traffic, 7½ per cent; Light traffice, 10 per cent. For brick: Heavy traffic, 9 per cent; Medium traffic, 11 per cent; Light traffic, 14 per cent. These figures are subject to modification, according to requirements of traffic and conditions of the brick, and are not to be taken as iron-clad limits.

The diagrams also show the losses for underburned and overburned brick, and a comparison may be made of the two rattlers by the rating of the brick. A study of these matters would be instructive. The values shown are borne out by numerous other tests also made in the Laboratory of Applied Mechanics of the University of Illinois, a number of them on brick which had seen service in the streets of Columbus, Ohio; Springfield, Ill., and Champaign.

In taking up the subject of inspection of paving brick it must be admitted that inspection is generally an unsatisfactory topic to both contractor and municipality. Inspection is a difficult task requiring skilled judgment, expert knowledge, intelligent action, and ability of no mean order, as well as the qualities of tact, balance and horse sense. Men of this kind available for this purpose are rare. It is not so much that the politician desires to appoint a favored citizen or that the residents on a street feel that one of their number will best serve their interests. The municipal administrative officer will usually gladly waive these considerations if an inspector of the ideal type can be found. But the work for an inspector is spasmodic, and the season is short, and his importance in the constructive world is not yet so well established that he receives the salary of a football coach, so that we must not expect a surfeit of ideal inspectors. However, the first requisite of paving brick inspection is a levelheaded and wide-awake inspector, and it is to the interest of all concerned that this class of men be developed.

Inspection involves a *study* of the brick put on the street. An inspector whose work came under my observation last summer selected types of brick which he found, what he thought to be soft or hard or brown or brittle or red or black or what not, and made a lot of rattler tests and absorption tests to determine the relative place of these various types and to aid his judgment in the inspection. This is a step in the right direction. It illustrates what was meant by saying that tests and requirements should be useful in educating inspector and citizen and contractor.

The difficulties of inspection are increased by the way material is loaded on cars and piled on the streets. Good and poor are mixed together indiscriminately, even when the change of quality is apparent as the wagon is loaded. Lack of uniformity is the bane of paving brick. May not the manufacturer remedy this in part at least, and place the mediocre brick on streets which want cheap brick and selected brick on streets which are willing to pay for a serviceable article?

And this leads me to another suggestion, that the brick be inspected at the yards, much as steel is inspected at the mills. This could be done by bureaus of inspection which would employ expert inspectors, as is done in the case of steel inspection, and this service would be paid for by the thousand of bricks inspected, or yard of pavement to be put down, instead of at a dollar and a half a day. The bureau of inspection would be given the requirements specified for the brick in the ordinance, and the contract, and would certify to the quality of the brick. This inspection would not entirely relieve inspection on the street and in the pavement, for chipped, broken, and otherwise defective brick would still show up, but it would make rejection of a poor lot of brick less objectionable to the producer, and if properly carried out would, in my opinion, result in great gain for both the manufacturer and the municipality.

Altogether, inspection covers a multitude of details, involves everlasting vigilance, and entails patience and even temper, and the city which can get good inspection is indeed fortunate. A reputation for severe inspection is said to cause an undue increase in the bids for work, but this charge must not be accepted without consideration. Five cents a yard extra is only the cost of a year's life of a pavement on a residence street or six months' on a business street, and who will not say that the difference in quality of brick may not make five or ten years, or even more, difference in the life of the pavement? Surely, adequate and judicious inspection pays for itself many times over.

Let the consumer define his needs; let the producer bid on this product. Consumer and producer may then adjust needs and prices according to prevailing conditions. The writer has not attempted to go into details as to how large a chip or how crooked a face is cause for rejection of the brick; he has instead touched upon the larger question of the relation between producer and consumer and their agents. Brick must continue to be the principal material for street pavement in the inland cities of Illinois. In the last decade this material has been lifting our prairie cities up out of the mud and permitting the beautifying of streets and adjoining property. Let us hope that its usefulness will be enhanced by mutually understood requirements and tests and adequate and judicious inspection.

BRICK.

Ref. No.	Grade.	Loss in Per Cent. Stan.	Talbot-Jones.
6	Standard	15.6	4.0
3	No. 1 Brown	22.3	10.2
2	No. 1 Red	24.3	9.7
4	No. 1 Standard	28.4	9.8
5	No. 2 Soft	31.2	15.2
1	Overburned	35.6	18.8

BLOCK.

Ref. No.	Grade.	Loss in Per Cent. Stan.	Talbot-Jones.
13	Standard	13.3	2.4
15	Standard	15.2	5.6
14	Granite (spring)	15.3	4.5
9	No. 1 Red	16.5	5.0
17	C	17.0	8.4
10	No. 1 Brown	17.8	7.6
16	Duro (Cleveland)............	20.0	5.6
11	No. 1 Standard	20.6	4.2
8	Overburned	27.4	12.0
7	Underburned	30.2	13.3
12	No. 2 Soft	31.2	18.1

The President: We would like to hear from Mr. D. V. Purington on this question; he is also a member of a committee which adopted the National Association test.

Mr. Purington: Gentlemen, I have attended quite a number of meetings with Prof. Talbot, and in the old days we gave a great deal of time and a great deal of hard work to securing a practically uniform test. I don't know that we did enough for me to make any discussion on his paper.

I agree with Prof. Talbot that while the present method of testing brick is not an ideal one, it is certainly far ahead of anything that we have had before, and we don't want to let go of that until we get samething better. I doubt very much whether the absorption test is entitled to a great deal of consideration, because I think that any judge of paving brick—and he wouldn't have to have a great deal of training along that line either—ought to be able to judge whether brick was too soft to go into the street to be paved. My own experience has been that a brick that will stand less than 1 or 2 per cent of absorption should never be put upon the street at all; my judgment would teach me, and my experience too, that brick that would absorb from 4 to 6 per cent would perhaps make as good a paving brick as those that absorb less. I have in mind one particular piece of paving that I have been watching now for ten years; there has never been a repair made on it or a brick taken out, and after a rain quite a large percentage of them will show that they have absorbed water, and yet that piece of paving is in a perfect condition.

The question of inspection is something that we don't know very much about, and we don't dare to say what we do know. I have known of many instances where men of finest intentions, and who wanted to do just what was right, but who were absolutely ignorant of their duties, came to me and asked me what to do in connection with their own business.

I only cite this as a specimen of the ignorance, the almost universal ignorance, of the men appointed to inspect brick on streets. I understand that Mr. Stipes is an inspector himself—that may solve a great many of our difficulties. (Laughter.) I am going to have a talk with him.

I always like to hear Prof. Talbot. I like to hear a man talk about something that he knows something about, and those of us who have been pioneers in the paving brick business in Illinois must certainly take off our hats to Prof. Talbot. We are indebted to him for very many helps. He has got us out of many bad places and bad holes.

The President: Can we hear from Mr. Will P. Blair of Terre Haute on this question?

Mr. Blair: Mr. President, I don't know that I can add anything to what has already been said. Prof. Talbot has studied this question for a number of years. I agree with him in almost every point raised by his paper, with the possible exception of one or two very minor points. But, still, as to what I would say and he would say, there is not perhaps so much disagreement after all.

I am inclined to think, myself, that the latter test, the absorption test, and the cross-bricking test, are all equally necessary to determine the quality of brick, and yet those several tests cannot be applied with equal force to each several kind of brick. That is to say, there are certain elements of strength that are to be found, for instance, in Mr. Purington's brick, that might go to determining that strength and the treatment of that necessary to develop the strength of that brick, yet in another brick the same treatment would develop altogether a different strength, so that the same brick of one kind of make, allowing but 2 per cent absorption, would be worth more to that brick than 5 per cent absorption would be worth to another brick. It depends upon the chemical constituents of the brick and the treatment that it had received. So, to make it practicable, a brick of one manufacturer that will allow but a 2 per cent absorption will last as long in the street as a brick of another manufacture with 4 per cent absorption.

Mr. Purington: Now, Mr. Blair, may I ask you a question on that? Wouldn't the rattler test bring out the relative values of those two bricks without regard to the absorption of them at all? By putting those bricks through the rattler test, wouldn't the 2 per cent in the one and the 4 per cent in the other appear in the rattler test?

Mr. Blair: I undertook to answer your question by saying that the rattler test, the absorption test, and the cross-bricking test were necessary in the final determination of the value of every brick that is made. That is the point that I want to make clear —that is, each several test bears a particular relation to quality to each brick, but not to all alike. Now, there is one thought that Prof. Talbot has brought out, and that is this: with reference to inspection at the yards. Now, I undertake to say that there is not a manufacturer of paving brick in this entire country who would not be very glad to have that state of affairs brought about. It may be that the general public are suspicious of us; that we want to put a quality of brick upon the public streets to an extent that will injure them. I do not think that is the case at all. I am ready to dispute that proposition at all times and under all cirsumstances, because I have believed from the start that the interests of the manufacturer of paving brick lie with the interests of the property owner; the man who pays the bills. And, leaving myself out of the question altogether, I undertake to say that the interest on the part of the paving brick manufacturer is to put the brick on the market that will last the longest, both in his manufacture and in the selection of the brick itself at the yards.

Now, then, we are indebted to Prof. Talbot for a long series of technical investigations that he has made, and I am exceedingly thankful to him for the information that I have obtained from time to time, and I use it daily in the management and out-bound shipments from our factory. I use it to determine for myself by way of comparison as to what is the best brick that we make, and we make our selections accordingly. And I undertake to say that our practice in that respect is Mr. Purington's rule and the rule of every manufacturer in the State of Illinois. That we do not get something imperfect on the market I do not undertake to say. We do. We get something imperfect. But my experience has been that after those imperfect ones not picked out after they get onto the street. Not because of crop out through the carelessness of our own employes they are the dishonesty of our inspectors, but a man that knows nothing of the manufacture of brick, and who is selected because he is a careful, prudent man, and I believe that many of them are, he simply does his best and does it honestly, but nine times out of ten he picks out and rejects the brick that is the best and not the worst.

The President: Gentlemen, we have heard two brick manufacturers, and if Mr. Jansen is in the audience we would like to hear from him on that subject.

Mr. Jansen: Mr. President, there is just one point that I would like to make, and I emphasized it in my paper last year; that is this: That I think it would be far better if in some way the municipalities could inspect the brick before it left the plant. I think it would be justice to the manufacturers because in a great many instances brick are rejected after they are on the ground, and it is not exactly the manufacturer's fault,

I don't believe that I have anything further to say; when Mr. Purington and Mr. Blair have discussed the subject, I think it has been discussed pretty thoroughly.

The President: It seems to me that the cement factories have instituted a Bureau of Inspection at their plants. It should not be a very difficult matter for the brick people to get something on the same line, if they would get together on it.

The question of sand-lime brick manufacture is a live one, and it occurred to the Executive Committee that we had heard several times from men who are representing the manufacture of sand-lime brick, and we had also had some papers from clay men criticising the sand-lime manufacturers. It occurred to us that it would be a good idea, if we could, to secure an entirely unprejudiced and unbiased opinion on this matter, based on actual tests and actual investigations. With that end in view we came to the University of Illinois and Prof. H. B. Fox started an investigation with Prof. C. W. Rolfe. He will give you the result.

A COMPARATIVE STUDY OF SAND-LIME AND CLAY BRICK.

My topic is a comparative study of sand-lime brick as they appear on the market and some clay brick which would be their natural competitors.

Before entering upon this topic, however, I have thought best to discuss briefly the characteristics of the ideal sand-lime brick. In this discussion I shall make frequent reference to an article by S. V. Peppel in the fifth annual volume of the Transactions of the American Ceramic Society, an abstract of which may be obtained from the Director of the United States Geological Survey.

This ideal sand-lime brick is essentially a mass of the sillicate of lime, probably $CaSiO3$. To produce this it is necessary to bring together under heavy pressure 56 parts of finely divided caustic lime (CaO) and 60 parts of fine sand, and to expose the mixture for several hours to the action of superheated steam. The specimen I hold in my hand was made in this way except that the moulding pressure was 800 lbs. per sq. in., while Peppel finds that 15,000 lbs. gives the best results.

In order to obtain this union it is necessary (1) that the lime selected be as nearly as possible a pure calcium oxide, CaO, because magnesium oxide is less active than calcium oxide and the compound which it makes seems to have less strength. It is also necessary that the lime be thoroughly slaked and very finely divided.

(2) The sand must be pure quartz and very fine. Clay and most other common impurities are inert and do not enter into combination with lime. Peppel states that sand which will not pass a 100-mesh sieve does not unite with lime, and that only a part of that which passes a 100-mesh, but is retained by a 150-mesh, will do so. This statement is probably a little strong, from a scientific standpoint, but as a commercial statement it is probably near the truth. I have here two bottles containing sands of this degree of fineness.

(3) The sand and hydrated lime must be so thoroughly mixed that each sand particle is in contact on all sides with particles of lime. Particles which are not in actual contact do not unite chemically.

(4) The mixture must be subjected to heavy pressure in order to force the particles into contact and to give form to the brick.

(5) The bricks must be subjected to the action of steam showing a pressure of 120 or more pounds. If conditions are just right chemical union begins at a somewhat lower pressure than this, but practical experience indicates that this is the lowest that can be relied on.

Whenever these five conditions can be met there is no doubt but that brick of good quality and in every way desirable can be made, but deposits of silica of the required fineness are not often found, and the cost of grinding adds largely to the expense of manufacture. In order to in a measure cover this point Peppel made some experiments to determine how much coarse sand, *i. e.*, sand above 100-mesh, can be added to the above mixture. He found that the addition of coarse sand increased the crushing strength of the brick, but reduced the tensile strength. His experiments were not very conclusive as to the proper amount. Some investigations of our own seem to indicate that the amount varies with the character of the sand used. If the voids or vacant spaces between the grains of the coarse sand be carefully measured and enough of the above mixture introduced to completely fill these voids after pressure has been applied, a good brick will be produced. Of course, in this case the mixing must be thoroughly done.

The only change in the scheme of manufacture sketched above which is necessitated by the introduction of coarse sand is that greater pressure must be applied to cause the sand grains to interlock and reduce the voids. The amount of pressure necessary will vary with the character of the sand used and the amount of water introduced. Peppel found that with the sand and degree of moisture he used 15,000 lbs. pressure per sq. in. gave the best results.

I have here a specimen made with sand having 33 1-3 per cent of voids. These voids were filled with a paste made as described above. The proportions by weight are caustic lime (CaO), 10 per cent; finely ground quartz sand, 10 per cent; coarse sand, 65 per cent, the rest being water used in hydrating the lime and moistening the sand. This specimen was subjected to only 800 lbs. pressure. Heavier pressure would have given it greater solidity and a more uniform surface.

Let us now leave the theoretical part and give our attention to the tests made, the methods used in applying these tests, and the results obtained.

POROSITY:—One of the first things usually determined is the porosity, or percentage of vacant spaces in the brick mass. The method used in obtaining the porosity of the materials was the same, except in minor details, as that used by Mr. Buckley on the building stones of Wisconsin. From an examination of the different methods used we have concluded with Mr. Buckley that the following principle is the only one by which the true percentage of voids can be obtained.

The blocks were first dried in an oven at 300 degrees Fahrenheit to constant weight, *i. e.*, until upon reheating they no longer lost weight. The blocks were taken from the oven, cooled in a dry atmosphere over concentrated sulphuric acid, and then carefully weighed. This gave the first or dry weight. After the dry weight was obtained the blocks were placed in a vessel of distilled water under the bell-jar of an air pump, and the air exhausted. By so doing, the air was drawn from the voids and the water given a chance to completely fill them. The bricks were left to soak in a partial vacuum for 24 hours, giving time enough for them to become completely saturated. After this treatment they were taken from the water, one at a time, the water dried from the surface with a soft muslin cloth, and then quickly weighed. This second set of weights is the weight of the blocks with the voids completely filled with water. The difference between the two weights is the weight of the water taken up by each block. The blocks were again weighed suspended in water for the third set of weights.

Now, by dividing the dry weight of each block by the difference between the wet and dry weights, we get the specific gravity of the material, *i. e.*, the weight of the brick material compared with the weight of an equal volume of water. If now we multiply the weight of the water absorbed by the specific gravity of the brick material, we have the weight of the solid material necessary to fill the voids, and by the addition of this weight to the dry weight of the blocks we have the weight of the bricks if they were solid. By dividing the weight of the material necessary to fill the voids, as already found by the solid weight, we have the percentage of porosity or the relative amounts of solid and void.

Reducing the statement of the above process to a simple formula, it is as follows:

$$\text{Per cent of pore space} = \frac{(W-D)\ \text{sp. gr.}}{D \text{ plus } (W-D)\ \text{sp. gr.}}$$

in which W equals the saturated and D the dry weights.

The method ordinarily used is to dry the brick, weight it, soak it for 24 to 48 hours, dry the surface and weigh again. The difference between the two weights divided by the dry weight is called the percentage of absorption or porosity.

This method is faulty in a number of ways. We know the voids in all kinds of more or less porous materials are not all of a size, but that a part, and often a very large part, are very minute. This fact often causes error in two ways: 1st. If great care is not taken in drying, the water is not all driven out and the first weight is wrong. 2d. If the material is well dried it is impossible to fill these pores in 24 or 48 hours' soaking. We have kept ordinary sandstones in boiling water for 72 hours, and even then the air pump showed that the voids were not completely filled. This accounts in large part for the extremely low percentages of porosity shown for many materials. A second source of error enters the computation. By the usual method, the weight of the water absorbed is divided by the weight of the dry material. But since the percentage of absorption is the ratio between the volume of the brick and the volume of the voids, or between the weight of the solid brick and the weight of enough solid material of the same specific gravity to fill the voids, both weights must be calculated to the same kind of material. By the usual method, however, we are considering the voids as filled with water which is only about two-fifths as heavy as the brick material, and consequently the ratio obtained is much too low. Also, the smaller the pore spaces the greater the error.

For illustration we have taken the porosity of a single sample of three different kinds of brick by the usual method for comparison:

Percentage of pore space.	Old Method.	New.
Michigan City, sand-cement-lime	8.7	32.0
Kokomo, sand-lime-burned	24.03	46.4
Danville, vitrified clay	.31	3.4

From the above table it will be seen that the smaller the pore spaces the greater the relative error. If, now, we had two bricks with the same percentage of porosity, one with large voids the other with small ones, by the usual method the latter would give a much lower percentage than the former and appear to be the better brick when the reverse might easily be the case.

The different kinds of brick tested with the specific gravity and porosity of each is given in the following table, each result being the average of five samples:

	Sp. gr.	% Pore sp.
Michigan City, sand-lime	2.652	35.9
Michigan City, sand-cement-lime	2.678	32.
Kokomo, sand-lime	2.629	47.3
Kokomo, sand-lime, burned	2.533	46.4
Lafayete, sand-lime	2.65	31.1
Lafayette, sand-lime, 2% cement	2.672	30.4
St. Louis, red pressed clay	2.586	23.5
St. Louis, gray pressed clay	2.658	19.82
St. Louis, yellow pressed clay	2.622	17.3
Danville, vitrified clay	2.49	3.4

The porosity depends in the sand-lime brick not so much upon the size of the sand grains as whether there is sufficient material present fine enough to fill the voids between the larger grains and upon the pressure used.

FREEZING.—Closely related to the porosity and depending to a large extent upon it is the action of frost.

I may say here that the freezing or the thawing test as applied to those materials is very much more severe than when applied under natural conditions. For this reason: This material is first saturated with moisture and there is no chance for any evaporation of the water enclosed, and when the water freezes its whole strength is exercised in pulling apart the brick, while under ordinary conditions a portion of the water at least evaporates before the water is frozen.

Because of unavoidable delay in getting the power with which to feed the saws, the blocks for these tests, except in the case of the Michigan City sand-lime brick, were cut out with broad chisels and then the faces of all except the clay brick ground down until they were smooth. A set of ten of each kind was made and then half were taken for each test. The freezing test was made as follows: The prepared blocks were dried, weighed, saturated with water, set in a wire basket, put into a sheet iron can and placed in the freezing mixture. The temperature of this mixture varies from —20 degrees to +18 degrees Fahrenheit. After the blocks were frozen they were removed basket and all from the freezing can; placed in a similar can partially full of distilled water, and set in a warm place to thaw. They were frozen and thawed in this way 18 times, and by all being together in the wire basket of course received exactly the same treatment. The cubes were then dried, reweighed, examined and crushed. So far as the clay and Kokomo waste glass brick are concerned there was no visible change other than that to be expected from handling and manipulation.

The Kokomo sand-lime brick went to pieces so badly there was no chance for applying the crushing test to the frozen material. The loss for the samples of this brick taken was practically 100%.

There seems to be very little difference between the other sand-lime brick. All had more or less loss from the surface by scaling and one sample of the Lafayette sand-lime brick lost almost 50%. This, however, may have been due to an unusual flaw in that particular brick as the remaining samples were about the same as the average. The greatest loss on any specimen of the Michigan City brick was 5.84%, the average loss 2.69%. The greatest loss for any specimen of the "Union," Lafayette cement-sand-lime, was 5.32%, the average loss 1.92%. The "American" Michigan City cement-sand brick did not seem quite so good, the greatest loss being 8.81% and the average loss 5.58%. The following table shows the loss by weight of the samples frozen:

Loss of Weight Per Cent After Freezing and Thawing 18 Times.

Michigan City, sand-lime	2.69	Surface scaled
Michigan City, sand-cement-lime	5.58	Surface scaled
Kokomo, sand-lime	100.	Crumbled
Kokomo, sand-lime, burned	0.00	
Lafayette, sand-lime	13.22	av. 3, samples 4

Lafayette, sand-lime, 2% cement	1.92	Surface scaled
St. Louis, red pressed clay	0.00	
St. Louis, gray pressed clay	0.00	
St. Louis, yellow pressed clay	0.00	
Danville, vitrified clay	0.00	

The above table shows that all of the sand-lime and cement sand-brick tested were more or less broken down by freezing and thawing.

After the material had been frozen it was dried, reweighed, examined and sent to the testing laboratory of the College of Engineering to be crushed. The following table shows the effect of freezing and thawing on the different kinds of brick:

Effects of Freezing on Crushing Strength.

Michigan City, sand-lime	Loss	18 %
Michigan City, sand-cement-lime	Loss	23.65%
Kokomo, sand-lime	Crumbled	
Kokomo, sand-lime, burned	Loss	22.66%
Lafayette, sand-lime	Gain	8.42%
Lafayette, sand-lime, 2% cement	Gain	22.66%
St. Louis, red pressed clay	Loss	21.69%
St. Louis, gray pressed clay	Loss	15.08%
St. Louis, yellow pressed clay	Loss	11.12%
Danville, vitrified clay	Loss	40.71%

An examination of the above table will show that all except two were materially weakened by freezing. The greatest loss of strength is shown by the Danville vitrified brick. This is due to the fact that the brick is very compact and that nearly all the absorption is due to lamination cracks, which are, of course, the planes of weakness in the material. When, then, the water freezes and expands in these cracks, the weakness is further developed. In the pressed brick the percentage of loss in strength is in almost exact proportion to the porosity. The gain in strength shown by the two kinds of Lafayette brick is almost certainly due to the change of the free lime present to the carbonate of lime, which has much higher binding power. Further proof of this statement will be given in discussing the action of carbonic acid gas on the moist material. I think we are justified in concluding that all material is injured by freezing and that the amount of injury depends upon the percentage of porosity, the size of the pores and physical make-up of the brick all working together.

CRUSHING STRENGTH.—The crushing strength tests on this material were made by Mr. Curfman, acting under the direction of Professor Talbot, of the College of Engineering. The blocks prepared as above were capped with plaster of paris to give a smooth uniform bearing surface. The results given in the following table are the averages of five blocks:

Crushing Strength.

Michigan City, sand-lime	1007.5	lbs. per sq. in.
Michigan City, sand-lime-cement	1818	lbs. per sq. in.
Kokomo, lime-sand	686	lbs. per sq. in.
Kokomo, lime-sand, burned	1778	lbs. per sq. in.
Lafayette, lime-sand	1164	lbs. per sq. in.
Lafayette, lime-sand, 2% cement	1040	lbs. per sq. in.
St. Louis, red pressed clay	7415	lbs. per sq. in.
St. Louis, gray pressed clay	3526	lbs. per sq. in.
St. Louis, yellow pressed clay	4746	lbs. per sq. in.
Danville, vitrified clay	9300	lbs. per sq. in.

ACTION OF HEAT.—In order to judge somewhat the behavior of the different classes of brick under the action of intense heat as sometimes occurs in burning buildings, specimens of each kind of brick tested were placed in succession behind an asbestos screen, so that one face only was exposed, and the flame of a blast lamp turned on the exposed face.

The intensity of the heat was regulated so that in about 15 minutes the face of the brick was at a bright red heat. Two of the specimens were allowed to cool in the air, while two were immediately placed under a stream of running water.

The effect of this heat on the pure sand-lime brick was to weaken them perceptibly to the depth of an inch from the exposed face, the heat having loosened the cementing material. The exposed face was whitened and could be rubbed off with the fingers.

The small pieces of the brick flaked off from the corners and the edges, but there were no cracks developed. Under the action of sudden cooling the spawling off of the heated face was increased and the brick was further weakened. The sand-lime brick which had considerable clay in its makeup, however, behaved somewhat differently. Instead of being softened by the action of the heat it was slightly hardened. Cracks one-half inch deep appeared on the exposed face similar to the cracks in drying mud, the brick was discolored and weakened to the depth of five-eighths inch. Under the action of water the edges spawled off slightly and the cracks were increased. Otherwise there was no difference in the specimens.

The cement-sand-lime bricks behaved somewhat better. Though the exposed face was whitened and softened to a depth of one-quarter to one-half inch, the remainder of the brick seemed unharmed. The water did not affect them except to slightly deepen the zone of weakening.

The pressed clay brick was scarcely injured by the heat. Incipient cracks appeared on the exposed faces, and in some cases the brick was discolored and slightly weakened. Otherwise under either treatment the brick were not affected.

The vitrified clay bricks, as might be expected, were badly cracked one and one-quarter inches deep by both methods, the water only increasing the cracks. Beyond this zone, however, the brick was apparently as sound as ever. The vitrified sand-lime brick was apparently unaffected in any way by heat or sudden cooling.

The relative rank of the specimens tested then, would be:

First, vitrified sand-lime brick.
Second, pressed clay brick.
Third, cement-sand-lime brick.
Fourth, sand-lime and vitrified clay brick.

That this was a fair test the recent fire in Champaign gave proof. A wall built of soft burned brick was exposed to the full heat of the flames for some time; this from time to time had a certain amount of water turned on it. Aside from a slight chipping from exposed surfaces the bricks are uninjured. It can be safely assumed that any brick that is not injured to any appreciable depth by the above test will stand the test of any ordinary fire.

ACTION OF ACIDS.—For the purpose of determining, if possible, what the action of the acids contained in the atmosphere would be on the material tested, some blocks were treated as follows: Ten 1-inch cubes were made from each kind of material and one-half subjected to the action of H_2CO_3 and the other half to H_2SO_4. All were first dried and carefully weighed. One lot was then saturated with distilled water and put into a vessel, closed except for inlet and outlet tubes, where the atmosphere could be kept moist and a stream of CO_2 passed through to keep the vessel full of the gas. After 20 days they were uncovered, dried, and reweighed, with the results shown in the following table:

Action of CO_2.

Michigan City, Sand lime	Gain 57%.
Michigan City, sand-cement-lime	Gain 1.41%.
Kokomo, sand-lime	Gain 2.2 %.
Kokomo, sand-lime, burned	No action.
Lafayette, sand-lime	Gain 2.13%.
Lafayete, sand-lime, 2% cement	Gain 4.53%.
St. Louis, red pressed clay	No action.
St. Louis, gray pressed clay	No action.
St. Louis, yellow pressed clay	No action.
Danville, vitrified clay	No action.

From the above table it will be seen that all of the sand-lime and cement-sand-lime bricks gained in weight. This gain in weight was, of course, due to the conversion of free lime CaO into lime carbonate $CaCO_3$ by the action of the carbonic acid gas. The gain in weight by the Michigan City materials was slight. In the case of the sand-lime, because the material had most of it been exposed to the weather for two years and the change had already taken place, and in the cement-sand-lime because the amount of lime used was small. The slight increase in strength due to this change to carbonate was much more than overbalanced by the loss in strength due to freezing, so that, as will be seen by referring to the table of crushing strength, both of these brick lost strength. In the brick from Lafayete there was a decided gain in weight showing the conversion to the carbonate had not yet taken place, and with the change came an increase in crushing strength, as already noted. As further proof that it was this change that gave the added strength, it will be seen that the gain in strength was in almost the same ratio as the gain in weight, the sand-lime gaining 2.13% in weight and 8.42% in strength, as against 4.53% gain in weight and 22.66% gain in strength by the sand-lime with 2% cement.

The action of the H_2SO_4 was not satisfactory largely because the acid was applied in a one-half of 1 per cent water solution instead of as a gas, thus giving chance for solution of the material. That solution resulted was clearly shown by an examination of the solution after the bricks were removed. The results obtained are shown in the following table:

Action of ½% of H_2SO_4.

Michigan City, sand-lime	Gain .46%.
Michigan City, sand-cement-lime	Gain .12%.
Kokomo, sand-lime	Loss .98%.
Kokomo, sand-lime, burned	Gain .35%.
Lafayette, sand-lime	Loss .28%.
Lafayette, sand-lime, 2% cement	Gain .5%.

St. Louis, red pressed clay	No action.
St. Louis, gray pressed clay	No action.
St. Louis, yellow pressed clay	No action.
Danville, vitrified clay	No action.

ABRASION TEST.—It is not customary to apply an abrasive test to building materials, but since the lower portions and the interiors of buildings are subjected to more or less wear, the test as applied to these materials may be of interest. Cubes approximately 1¼ inches on a side were prepared with three of the original brick faces. These cubes were dried, weighed, and placed in an ordinary stoneware jar with a number of pieces of rough angular quartz. The jar was 9 inches in diameter and was revolved in the manner of an ordinary rattler 18½ times a minute for an hour. The cubes were then removed, brushed, reweighed, and the loss calculated.

The Lafayette sand-lime, the Michigan City sand-lime and the Lafayette cement-sand-lime had the corners, edges, and original faces entirely worn off and were practically spherical. The Michigan City cement-sand-lime, the Kokomo sand-lime and vitrified sand-lime bricks had the corners and edges taken off, but the faces not worn to speak off. The clay bricks were none of them much worn and the Danville vitrified brick hardly at all. The results obtained may be seen from the following table:

	Corners.	Faces.	Loss %.
Michigan City, sand-lime	badly rounded	badly worn	35.5
Mich'n City, sand-cement-lime	badly rounded	slightly worn	16.9
Kokomo, sand-lime	badly rounded	perfect	10.3
Kokomo, sand-lime, burned	badly rounded	slightly worn	15.
Lafayette, sand-lime	badly rounded	badly worn	43.7
Lafayette, sand-lime, 2% cem't.	badly rounded	slightly worn	21.4
St. Louis, red pressed clay	slightly r'nded	perfect	2.7
St. Louis, gray pressed clay	slightly r'nded	perfect	2.8
St. Louis, yellow pressed clay	slightly r'nded	perfect	6.3
Danville, vitrified clay	slightly r'nded	perfect	1.2

A few words now in regard to the materials used in the manufacture of the sand-lime brick tested:

Michigan City, sand-lime—
Sand, 2-100 of 1% passes a 100 mesh seive.
Lime, a magnesian lime carrying a small amount of clay.
Pressure, 8,000 lbs. per sq. in.
Steam pressure, 105 lbs. for 8 hrs.
Michigan City, cement—
Sand, same as above.
Lime, a calcium lime carrying much clay.
Cement, Louisville.
Kokomo—
Brick made from waste from plate glass works, mixed with lime and steamed. This makes their sand-lime grade. The above brick are burned like clay brick to make their best grade.
Lafayette—
Sand, 2.1% will pass a 100 mesh sieve.
Lime, highly magnesian, some iron and clay.

In summing up I might say that while the sand-lime brick seem to suffer by comparison with the clay brick, they are not to be condemned without further investigation. The greatest trouble seems to be in the size of the sand grains, as shown in another place. We believe, further, that if proper methods of manufacture are used a number one brick can be made. The cost of manufacture, however, is likely to be much higher.

Before closing, there is one thing I should like to urge upon the attention of this association for consideration at another time; that is, the lack of a uniform and official set of tests to be applied to building materials. At the present time every man tests the material as he sees fit, and unless he describes his methods fully, we have no way of correlating the results. Furthermore, some of the tests that are applied are absolutely wrong, and even if applied in exactly the same way to different materials, will not give proportionate results.

In closing I wish to acknowledge the valuable assistance received from Professor Rolfe and Mr. Jones of the Department of Geology, who have worked with me from the beginning of the tests; from Professor Parr of the Chemical Department, Professor Talbot, Mr. Curfman and others of the College of Engineering, as well as from others who have contributed information and materials.

Then I have here a short paper on the same subject giving the chemical tests as made by Prof. Parr. I may say that I agree with Prof. Parr that in the sand-lime brick as now manufactured there is very little chemical bond of the calcium silicate and that practically all of the remaining substance is either in the form of the calcium hydrate or calcium carbonate, and that the tests that we have made show that quite completely.

I may say, in further proof of this, that when I put these materials into the acid in making the sulphuric acid test on the effect of acid, that most of them effervesced very rapidly.

The President: Gentlemen, I understand that there are some sand-lime brick people present. We would like to hear from them on the subject.

There seems to be no response. If there is no discussion on this subject we will pass on to the next number—the labor question; a matter in which we are all vitally interested. I hope somebody will take the initiative in this matter and get on his feet and give us a good sound talk on the labor question.

Mr. Purington: I suggest that we endorse the open shop and let it go at that.

The President: Mr. Purington says to endorse the open shop and let it go at that.

The motion was seconded all over the house.

The President: I think it will be wise to take a vote on this matter.

When he asked the members in favor of the motion to stand up, all arose, but when he asked for those opposed, even a chair in the front row refused to stand on its legs and toppled over. The president said he thought he could call the vote unanimous. He then announced that the banquet would commence at 8 o'clock and that the members were the guests of Mr. John W. Stipes of Champaign. A motion was then made and carried to adjourn.

MEMBERS OF THE ILLINOIS CLAY-WORKERS' ASSOCIATION.

J. H. Millsom, Macomb Sewer Pipe Co., Macomb, Ill.
Frost Manufacturing Co., Galesburg, Ill.
Andrew Barr, Urbana, Ill.
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Charles A. Gould, Main Belting Co., 55 Market St., Chicago.
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W. C. Morris, Christy Fire Clay Co., 4771 Morgan Ford Road, St. Louis.
S. H. Alsip, Standard Brick Co., Belleville, Ill.
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J. J. Gledhill, American Clay Machinery Co., Bucyrus, O.
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L. Pettyjohn, Pettyjohn Bros., Terre Haute, Ind.
B. H. Richards, Jr., Edwardsville Press Brick Works, Edwardsville, Ill.
T. A. Randall, T. A. Randall & Co., Indianapolis, Ind.
J. Wesley Stipes, Jr., Champaign, Ill.
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A. Connor, National Drain Tile Co., Montezuma, Ind.
C. D. Cowgill, Brockton, Ill.
Thos. Madden, Madden & Co., Rushville, Ind.
Walter Colyer, Albion Vitrified Brick Co., Albion, Ill.
Grant Kramer, Wallace Mfg. Co., Frankfort, Ind.
Peter Gibson, Scott Manufacturing Co., 609 Commonwealth Trust Bldg., St. Louis.
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D. H. Arbogast & Sons, Farmer City, Ill.
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C. A. Harbaugh, Mendota, Ill.
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O. W. Dunlap, Dunlap Mfg. Co., Bloomington, Ill.
F. E. Swift, 420 West Fourth St., Dayton, O.
R. A. Stipes, Campaign, Ill.
T. J. Carpenter, Altamont, Ill.
Harry de Joannis, Kenfield Pub. Co., 45 Plymouth Court, Chicago.
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A. Towle, Peoria, Ill.
Danville Brick & Tile Co., Danville, Ill.
R. M. Combs, Thomas Moulding Co., Chamber of Commerce, Chicago.
Oscar Frazee, Moweaqua, Ill.
F. L. Selley, Danville, Ill.
E. E. Meier, Chicago.
A. M. Dick, Southern Fire Brick & Clay Co., Hillsdale, Ind.
Geo. Roberts, Danville, Ill.
F. S. Swan, Chicago.
J. Gretencort, Montezuma, Ind.
H. Lambert & Son, Beaverville, Ill.
H. H. Prather, Covington, Ind.
S. S. Curry, Danville, Ill.
H. W. Nichols, Field Columbian Museum, Chicago.
F. A. Martin, Mazon, Ill.
L. H. Martin, Dwight, Ill.
L. R. Whitney, National Drain Tile Co., Terre Haute, Ind.
A. S. Currie, Reddick, Ill.
J. W. Wild, Gilman, Ill.
A. W. Thatcher, Ivesdale, Ill.
B. Youngman, Pesotum, Ill.
J. F. Martin, Arthur, Ill.
Geo. J. Walter, Chatsworth, Ill.
C. Steinmayer, La Salle Pressed Brick Co., La Salle, Ill.
P. L. Youngren, Milwaukee, Wis.
Dr. A. L. Converse, Springfield Paving Brick Co., Springfield, Ill.
M. W. Blair, Terre Haute, Ind.
A. E. Giles, Peoria, Ill.
E. B. Johnson, Leader Iron Works, Decatur, Ill.
H. Townill, Plainfield Tile Co., Plainfield, Ill.
John Townill, Plainfield Tile Co., Plainfield, Ill.
A. J. Meidroth, Peoria, Ill.
J. M. Powell, Orestes, Ind.
Will P. Blair, Terre Haute Brick & Pipe Co., Terre Haute, Ind.
H. Geo. Jerge, New York Blower Co., Chicago.
J. B. Bennett, Urbana, Ill.
E. R. Frazier, Chambers Bros., Chicago.
J. W. Robb., Clinton Paving Brick Co., Clinton, Ind.
Squire Rutan, Star City Brick Co., Lafayette, Ind.
Fred Titterington, Argillo Works, Rock Island, Ill.
L. E. Rodgers, L. E. Rodgers Eng. Co., 303 Dearborn St., Chicago.
P. M. Johnston, St. Elmo, Ill.
Wm. Gottfried Schneider, Marissa, Ill.
Alton Paving, Building & Fire Brick Co., Alton, Ill.
Gillett Brick & Tile Co., Woodhull, Ill.

INJUNCTION WAS NOT ISSUED AGAINST NORMANDIN MACHINES.

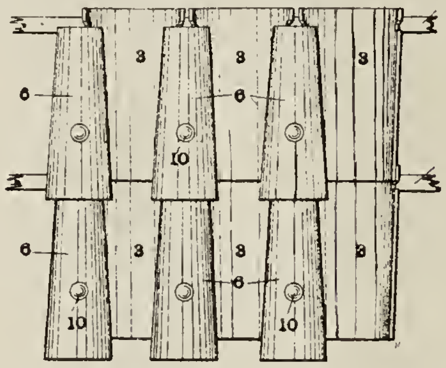
The *Globe-Democrat* having recently published a statement to the effect that an injunction had issued against the Normandin Cement Block machine, desires to retract this statement in full. We were misinformed as to the character of the suit and the parties affected by it, and in justice to those concerned wish to say that the proprietors of the Normandin machine were not named as parties to the litigation referred to, nor was the Normandin machine referred to therein. Our mention of this machine in connection with the proceedings was a mistake, which we cheerfully correct. —December 9, 1904.

The Standard Vitrified Brick Co., Coffeyville, Kan., has been incorporated with $70,000 capital stock.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

These new inventions are those that are especially of interest to any one engaged in the line of building materials and their manufacture, or machinery to make them.

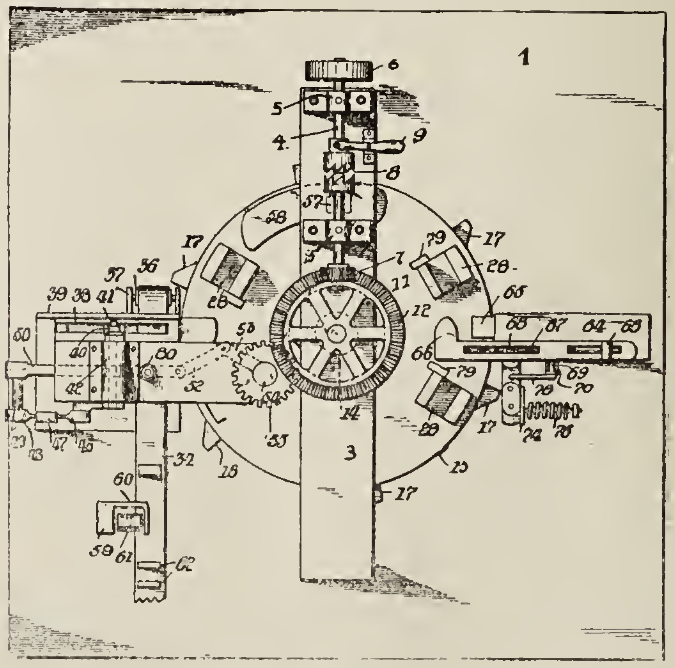
777,058. Tile Roof. Walter C. Mitchell, St. Louis, Mo., assignor to Mound City Roofing Tile Company, St. Louis, Mo., a corporation of Missouri. Filed Jan. 19, 1904. Serial No. 189,675. (No model.)



Claim.—The improvement in tile roofs comprising pantiles, each terminating laterally in upwardly-extending edges provided with notches and each provided with a hanger on the under surface, and roll-tiles arranged to overlap adjacent edges of said pantiles and each provided with a hanger to engage said notches in said pantiles, said hanger having a hole therein to receive a fastening-wire.

The improvement in tile roofs comprising substantially conico-segmental pantiles of substantially uniform thickness, arranged in horizontal rows with their concave faces upward, the pantiles of one row overlapping those of the next lower row, notches in the lateral edges of each pantile near the upper end thereof and below the lower edge of the pantile of the next upper horizontal row of pantiles, and each pantile provided with a hanger on its convex surface, and substantially conico-segmental roll-tiles of substantially uniform thickness, arranged with their convex faces upward and overlapping adjacent edges of said pantiles, each extending below the horizontal row of said pantiles to which it is connected and provided with a hanger arranged to co-operate with said notches in said pantile.

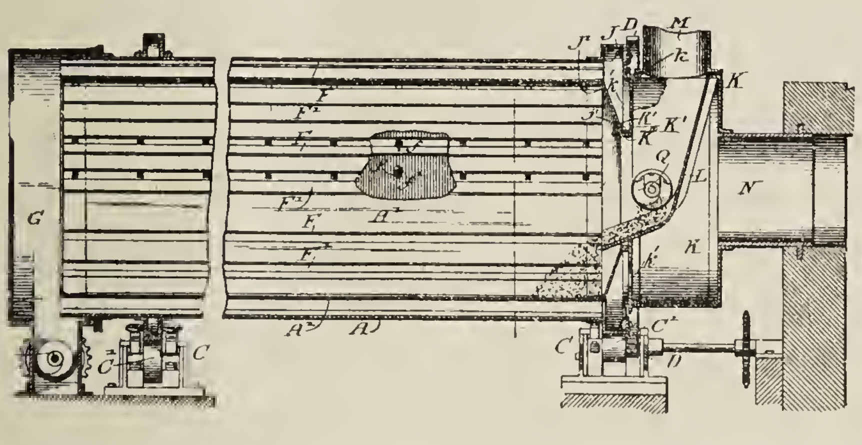
776,820. Brick-Pressing Machine. Isaac V. Wolfe, Johnetta, Pa., assignor of one-half to R. C. Simpson, Johnetta, Pa. Filed May 21, 1904. Serial No. 209,078. (No model.)



Claim.—1. In a brick-machine, the combination with a platform, a revolving table mounted thereon, a compressing arm and block carried by said table, each provided with a die, means whereby as said table revolves said arm and block will be vertically reciprocated, said table having cavities in which the said dies operate, means for ejecting bricks upon said table and means for removing said bricks from said table.

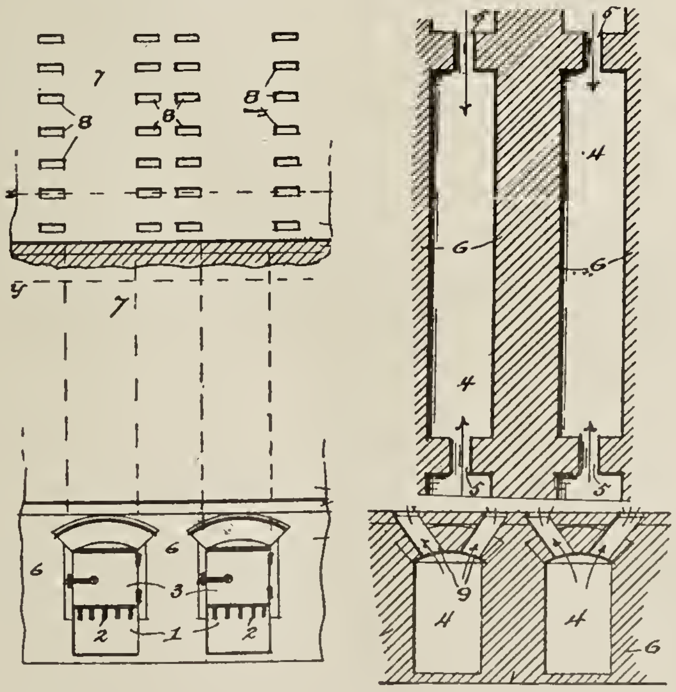
3. In a brick-machine, the combination with a platform having an endless conveyer mounted thereon, a revolving table mounted on said platform, a plurality of compressing mechanisms carried by said table and actuated as said table revolves, the table being formed with cavities which receive the bricks and sustain the same against lateral expansion while being operated on by said compressing mechanisms, means for ejecting the bricks from said conveyer to the table, and means for removing said bricks, substantially as described.

774,859. Drier. John E. Turney, Louisville, Ky., assignor of one-half to Charles E. Geiger, W. E. Koop and G. W. Fiske, doing business under the firm name of Geiger, Koop & Fiske, Louisville, Ky. Filed Dec. 21, 1903. Serial No. 185,974. (No model.)



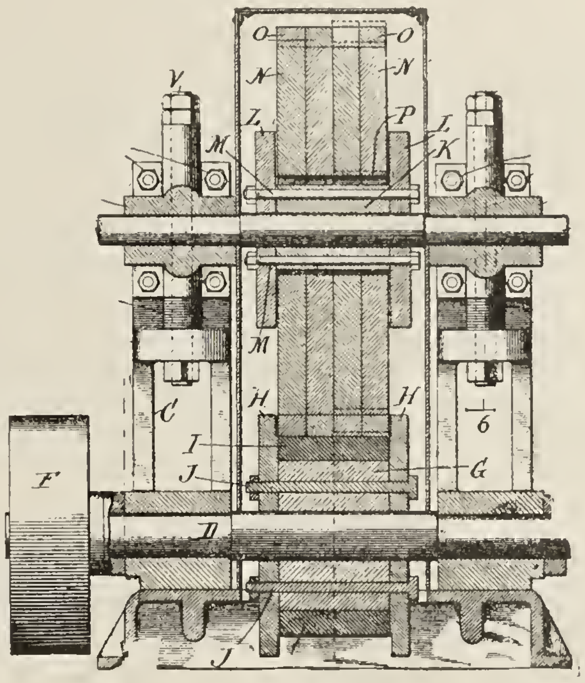
Claim.—1. A drier comprising an approximately horizontal cylinder having a double or hollow wall; longitudinal partitions extending through the annular cavity dividing the same into longitudinal flues; fixed receiving and discharge heads with which the cylinder and said flues communicate at the ends; means for supporting the rotating cylinder; the receiving-head being partitioned to separate an annular portion from a central portion, the annular portion only communicating with the flues, and the central portion communicating with the central cavity of the cylinder; an inlet for a heating medium leading into said annular portion, and a vapor-discharge tube leading from said central portion across the annular portion, and a final vapor-discharge pipe communicating with such throat.

775,047. Brick-Kiln. Joseph Sonka and Robert A. Metzner, Seguin, Tex. Filed July 18, 1904. Serial No. 217,094. (No model.)



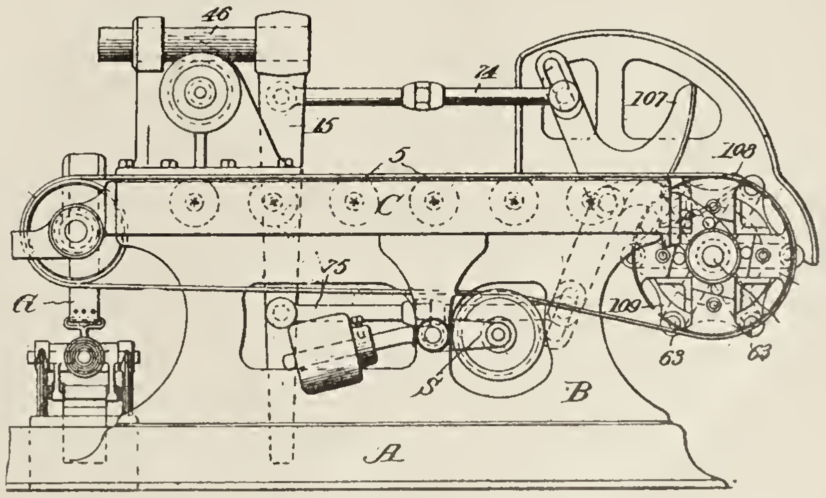
Claim.—In a brick-kiln, the combination with the walls forming separate flues each of which terminates in a contracted passage central of the flues, and the permanent floor forming a driveway flush with the ground-surface and having adjacent double rows of apertures arranged in pairs central of the said walls, of the ducts or channels inclined upwardly and outwardly from each other and connecting the top of the said flues with said apertures.

775,068. Pulverizer. Albert Raymond, Chicago, Ill.; Mary M. Bartelme, administratrix of said Raymond, deceased. Filed June 23, 1900. Serial No. 21,280. (No model.)



Claim.—1. In a pulverizer, the combination with a driving-roller, of a driven roller normally resting upon and rotated by frictional contact with the driving-roller, said rollers being out of vertical alignment, said driven rollers comprising a plurality of disks each having a central bore, a hub of less diameter than the bore of the disks on which the disks are mounted and have independent radial movement, said hub having longitudinally-arranged bolt-openings, disks of smaller diameter than the disks forming the said roller arranged at opposite sides of the latter, and bolts passed through said smaller-diameter disks and the bolt-openings in the hub, substantially as described.

777,081. Measuring-Drum for Clay-Working Machinery. William R. Cunningham, Bucyrus, Ohio, assignor to The American Clay Working Machinery Company, Bucyrus, Ohio, a Corporation of Ohio. Filed June 4, 1904. Serial No. 211,159. (No model.)



Claim.—1. In a brick and tile cutting machine, the combination of a measuring-table, a belt, a shaft, and a drum thereon and around which the belt passes said drum comprising a hub rigid on the shaft, a rim portion divided into segments, a disk loose on the shaft, projections carried by the loose disk and engaging said segments, a lug projecting from the loose disk, and a screw-bolt threaded in said lug and bearing against a fixed part of the hub whereby the segments are adjusted to vary the diameter of the drum.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

Clay Record Publishing Company,
Ninth Floor, Plymouth Building,
303 Dearborn Street,
CHICAGO.

GEORGE H. HARTWELL, Editor.

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Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

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ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVI. JANUARY 16, 1905. No. 1

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

CONVENTIONS.

The twenty-fifth annual meeting of the Iowa Brick and Tile Association will be held at Ottumwa, January 18th and 19th, 1905.

The fifth annual meeting of the Wisconsin Clayworkers' Association will be held at Manitowoc, February 23 and 24, 1905.

The nineteenth annual meeting of the National Brick Manufacturers' Association will be held at Birmingham, Ala., January 31st, February 1st, 2nd and 3rd, 1905.

The seventh annual meeting of the American Ceramic Society will be held at Birmingham, Ala., January 30th and 31st, 1905.

◆ ◆ ◆

We can run into debt, but it is not so easy even to walk out.

Do not think, because your name is in your hat, that everybody knows you. There are many who never have heard that you are alive.

Clay Record—semi-monthly—one dollar per year—largest circulation—best medium—and no chance for whiskers to grow before your ad is read.

We are getting many new subscribers now. Are you one of them? We shall soon be warm friends, no doubt, if you are. We know how to use you right, so will our advertisers. We don't carry the other kind.

The twenty-seventh annual 1905 meeting of the Illinois Clay Workers' Association is now numbered with the meetings of the past, but leaving behind it impressions not soon to be, if ever, forgotten; and the old-timers, one and all, declare it to have been an ideal meeting.

One of the first things to attract attention, naturally, is the attendance; and a comparison here proves interesting and encouraging.

The attendance for sixteen years has averaged $59\frac{10}{16}$ members at each meeting. At this meeting there were *one hundred and nine* members on the floor, besides twenty-five or thirty not enrolled, or, present at the meeting, about one hundred and forty people. There were more seated than in the last National Association meeting, and in any of the latter's previous sessions, with one single exception.

The satisfaction and encouragement resulting from the number present were insignificant when compared with the enlightenment and edification the papers yielded, and their general appreciation is honestly voiced in the remark of Mr. D. V. Purington—one certainly qualified to speak—as being the best papers ever read before any State or National meeting.

The credit of the splendid program selected belongs entirely to the Executive Committee, and was rendered complete with the exception of one paper on "A Modern Clay Manufacturing Plant," by Mr. H. C. Morrow, Whitehall, Ill., the failure to deliver which was due to sudden sickness in his family on the very eve of the convention.

The secretary informed the members that those selected to prepare papers were masters in the art of clayworking, and it was cheerfully acknowledged upon hearing the papers.

The Address of Welcome, by Hon. E. S. Swigart, and the Annual Address, by President F. W. Butterworth, Danville, were strikingly fitting and appropriate, the first making the members feel perfectly at home, and the latter illustrating what had been accomplished by the Association and predicting much for the future.

"The Operating of Brick Plants by Electricity," by S. H. Alsip, Belleville, Ill., was exceedingly able and certainly indicating the possibilities of the uses of electricity in and around clayworking plants as never before so clearly appreciated on the part of the members, nor its adaptations to the operation of dry press brick plants.

A paper by Fred R. Crane, B. S., Urbana, on "Drainage Suggestions for the Tile Manufacturers," proved to be of exceptional value, treating as it did of a subject that has never received the consideration at the hands of owners of clayworking plants its importance and value deserves, and was given great praise by such competent judges as Messrs. Cowgill, Whitney and others.

"The Selection and Care of Machinery" was a subject handled by Davis Brown and Charles Burridge. When one hears expert mechanics, such as these gentlemen are known and recognized to be, discourse upon the selection and care of machinery and recall from experience the limited pains given to the former and the narrow scope given to the latter, one is forced to admit there is much to be learned in these directions and regret the losses in the past because of neglect of and inattention to this subject.

Prof. A. N. Talbot, Urbana, read a paper on "Paving Brick, Testing and Inspection." Prof. T. is acknowledged as an authority on this topic, and his views are well known; but the additional light thrown upon the subject was indeed wonderful—and the emphasis on the point that all testing and inspection should be done at the works and not on the work was highly appreciated, and from opinions expressed it will not be long before this is the rule and not the exception, as in the past, when this matter is being determined, as is the rule in the steel industry.

"A Comparative Study of Sand-Lime and Clay Brick," by H. B. Fox, Urbana, Instructor on Geology, etc., proved to be one of the most entertaining and instructive papers read. The relative merits of these two processes is beginning to receive the unprejudiced consideration it should receive. It will not be far in the future when the manufacturers of brick machinery and clay products will be doing what will be having analogy to the steam engine builders and steam users' common practice now, the former building reciprocating and turbine engines and the latter installing both types in one plant; the brick machine manufacturer will be building machines for sand-lime and clay processes of making brick and the clayworkers using both types where conditions will admit.

The labor question topic was of particular importance and was interesting; the consensus of opinion seemed to be in favor of the open shop, there not being heard a dissenting voice.

"Concrete vs. Brick" was a paper ably presented by Will P. Blair, Terre Haute, Ind., evoked much discussion indulged in by Messrs. Lauer and Comb s and others. Mr. Lauer dealt so ably, in discussion, in handling this subject, displaying striking acquaintance with it, making so favorable an impression on his hearers that it drew out a request to write a paper upon the topic to be read before the next National Association meeting at Birmingham.

Prof. C. W. Rolfe started the ball rolling for the establishment of a clay laboratory, resulting in the appointment of a committee, a most excellent one, and from its caliber the Clay Workers of Illinois may now have confidence that it will become a fact in the near future.

"The Evolution of the Face Brick," by R. M. Comb s, Chicago, an excellent paper, doing the fullest justice to the subject, and giving it a treatment we do not remember the subject ever to have received.

G. E. Luce, Constructing Engineer, Illinois Brick Co., Chicago, read an article on the "Economical Construction of a Brick Plant," which proved to be eminently practical, and was handled in a most thorough and convincing manner.

"Joint Fillers for Brick Pavement," by I. O. Baker, C. C. E., Champaign, Professor Civil Engineering, University of Illinois, author of "A Treatise on Roads and Pavements," was a paper, the last on the programme, but certainly not the least. This subject is but little appreciated—in fact, it is one that has been neglected—and yet of exceeding importance. So great was the attention given to it, and so great was the interest manifested, we feel safe in making the prediction that the enthusiasm aroused will bear abundant fruit.

There was one thing observable and in striking contrast with many previous meetings—the limited amount of discussion following each paper, this being due to the exhaustive treatment of the several subjects by the authors of the papers, and no word could more emphatically describe the value to its members of the twenty-seventh annual meeting than this fact.

THE ILLINOIS BRICK COMPANY WILL SCALE ITS STOCK.

The reorganization committee of the Illinois Brick Company, appointed at the last meeting of the board of directors to devise a plan to readjust the capitalization of the company to a figure commensurate with its assets, has held its first meeting in the office of President George C. Prussing. The committee consisted of D. R. Forgan, E. A. Potter, A. C. Bartlett, George C. Prussing and B. F. Weber. A full statement of the affairs of the company and an appraisal of its assets had been completed by outside experts and was ready for presentation to the committee for its guidance.

The meeting was informal, but a large amount of work was done. The committee went over the statements presented and familiarized themselves with the situation as it exists. It was agreed by the committee, on the strength of the financial showing made, that a capitalization of $4,000,000, all of one kind of stock, would be equitable for the company, in view of the value of its assets. The committee further agreed that it would be equitable to exchange the present preferred stock share for share for the new stock. The committee then took up the question of the value of the common stock, and it was agreed that it would be fair to exchange the present common shares for the new shares on a basis of six of the old shares for one of the new.

This plan is exactly that of the management, which had been carefully worked out by President Prussing, and to which the consent of the largest holders of the stock of the company had been secured some time ago.

The plan will necessitate the retirement of a portion of the present preferred stock of the company in order to keep the capitalization down to the figure named in the plan. This will be accomplished by the retirement of the preferred stock at present in the company's treasury and through the purchase of a portion of the preferred stock now in the hands of the stockholders of the company. This purchase was long ago arranged for by President Prussing, who, foreseeing the advance which would come in the price of the stock when the plan for scaling the capitalization became known, secured the signatures of the principal stockholders of the company to an agreement to sell to the company the amount of stock needed at a uniform price of $60 a share. The reorganization, therefore, will be well within the means of the company.

The report of the reorganization committee will be written up and will be formally signed at the next meeting of the committee. It will be submitted to the meeting of the board of directors. After approval by the board it will be submitted to the stockholders at their annual meeting. Its success appears assured.

OBITUARY.

Seth G. Highland, a veteran potter, is dead at Jerome, Ohio. He was 73 years old.

Stephen Damhorst, Quincy, Ill., a pioneer brick manufacturer, died at his home at 1037 Oak street. He was 78 years old.

William Rankin died of typhoid fever in East Liverpool, Ohio, at the home of his sister. He was formerly of McKeesport, Pa., where he was the manager of a brick plant for a number of years. He was 35 years old.

George H. Brown, a prominent business man of Johnstown, Pa., died suddenly from a hemorrhage. He was born in 1859 and the president of the Seward Brick Co., besides being director of a bank and several land companies.

Joseph B. Rhoades, 57 years old, and a traveling man, died at his home in Terre Haute, Ind., of paralysis. He was engaged with the Vigo Clay Co. of Terre Haute, and the Chicago Sewer Pipe Company of Brazil, Ind.

ACCIDENTS, DAMAGES AND LOSSES.

The Chicago Hydraulic Press Brick Co. will bring action against the Lake Shore Ry. for $78,000 damages, alleging that a spark from an engine set fire to their Porter (Ind.) brick plant.

The receivers of the Arthur B Nitsch Brick Co., Baltimore, Md., have filed a bill to set aside a mortgage given to Anton Textor for $12,000, on the grounds that it is a fraud on the creditors of the brick company.

Henry R. Snyder, a stockholder of the National Roofing and Supply Co., Louisville, Ky., filed a suit against his business associates, claiming fraud, and asking that a receiver be appointed to take charge of the company's affairs and wind up its business.

Frank and Pearl Gaskill, two children, have asked damages to the amount of $10,000 each from the Marion (Ind.) Brick Co. and others, claiming that they were permanently injured by an explosion of gas. The company had a gas main in the street in front of their home, which blew up.

A petition has been filed for the appointment of an administrator of the estate of John Ritzema, who was killed by the caving in of an embankment in the brick yards of the Valley City Brick Co., Grand Rapids, Mich. The only estate left is a claim against the company of $3,000 for loss of life.

RECEIVED A GOLD MEDAL AT ST. LOUIS.

The Winget Concrete Machine Co. received a gold medal for their hollow concrete block machinery, exhibited in the Liberal Arts building. The medal and diploma will be issued by the Exposition company.

In addition to this exhibit the company had a most beautiful and imposing building made of their concrete blocks upon the grounds at the World's Fair. This building excited the admiration of visitors, and is a monument to the superiority of the Winget machine and the enterprise of the Winget Concrete Machine Co.

BRICK RINGS DEATH KNELL TO ASPHALT.

The great majority of taxpayers who are supporters of the plan for the city of Binghamton, N. Y., to resurface with brick the asphalt pavements in the business section are gratified with the splendid showing that the 2½-inch brick on Court street near Chenango is making. The test, which was advocated by *The Press* in the interest of a more durable, satisfactory and cheaper paving material, has proven to be all and a little more than was expected. The brick was put down where it would have as hard usage as it was possible to give it. This was early in October, and today a careful investigation fails to show the least mark of wear. Citizens who favor the scheme to resurface all the badly worn asphalt pavements with brick believe that now the common council has had a practical demonstration of the practicability of brick it should adopt it on streets that will be resurfaced next season.

This year the city spent nearly $15,000 for asphalt repairs. It is an open fact that in the end a very large sum of money will be saved if the asphalt fallacy can be permanently removed. Binghamton is not the only city in the state that is trying to get from under the everlasting burden of patching up asphalt pavements. There seems to be no end to the expense and at the best what remains is a patchwork and a daily new crop of holes is certain. The New York city taxpayers are clamoring for a change, and are willing to go back to the noisy and unsanitary Belgian blocks rather than continue with the unsatisfactory and dangerous asphalt.

The asphalt trust has its agents in Binghamton working with city officials even at this early day, but if the voice of the taxapers is heeded it is believed no more asphalt will be laid in this city.

THE C. O. BARTLETT & SNOW CO.'S RECENT SALES.

The Dundee Silica Sand Co., Dundee, O., elevating and conveying machinery.

Leisy Brewing Co., Cleveland, O., tube barley conveyor.

Pattison Supply Co., Cleveland, O., coal conveyor.

T. S. Henderson & Co., St. Louis, Mo., special cable conveyor.

C. L. Holck & Co., Monterey, Mexico, mining machinery.

Royal Crown Lead Co., Detroit, Mich., paint machinery.

Moore Bros., Cleveland, O., and New York, paint machinery.

Lowe Bros., Dayton, O., paint machinery.

International Harvester Co., Chicago, Ill., paint machinery.

Independent Stone Co., Cleveland, O., two steam hoists and derricks.

The Underwriters' Land Co., Carthage, Mo., large ore elevator.

Lorain Supply Co., Lorain, O., style E rotary dryer.

The Berg Co., Philadelphia, Pa., Triumph steam dryer.

General Chemical Co., Cleveland, O., direct heat dryer.

Ross Keller Tripple Pressure Machine Co., St. Louis, Mo., direct heat rotary dryer.

FIRE! FIRE!! FIRE!!!

The large brick works at Fish House, N. J., owned by Hatch Bros. of Camden, was entirely destroyed by fire, causing a loss of $40,000; insurance, $20.000.

The immense warehouse of the Portsmouth (O.) Harbison-Walker Brick Co. was destroyed by fire. The plant has been idle for some time on account of labor troubles. The plant is located at South Webster, Ohio.

The plants of the Kewanee (Ill.) Mining & Manufacturing Co. sustained a $90,000 loss by fire. The insurance is $70,000. W. V. Eddy is the president and H. S. White secretary and treasurer. The company manufactures brick and ice.

A TALC COMPANY READY FOR BUSINESS.

The North American Talc Company, Portland, Maine, which was organized about two years ago, have secured the plant formerly occupied by the American Stone Co., on Deak's wharf, and are establishing a large plant for the grinding of the crude material which is to be imported in large quantities from Newfoundland.

The plant will consist of a large number of mills for the pulverizing of the material and will give employment to nearly 200 hands when completed.

The company imported last year nearly 250,000 tons of the material which in the pulverized form is used for many purposes, namely, for talcum powders, face powders, and is also taking the place of china clay in the manufacture of paper and cheap cotton cloth as it adds more weight to the finished material. It is also used to some great extent in adulterations of many articles, principally cheap candies.

It is expected that the business will be very extensive after the plant has been running for some months. A cargo of about 2,500 tons of the crude material will be landed here about the middle of next month as it is expected that the plant will be ready for operation at that time. It is also announced that if the business will warrant it a regular line of steamers will be established between this city and Newfoundland for the transportation of the talc in the crude form.

ASSOCIATION TO WREAK VENGEANCE ON SMALL DEALERS IN COUNTRY.

The efforts of the United States Potters' Association to maintain a combination by which the price of American-made pottery might be kept up to a high point, have failed and it is said here that a price war will be instituted this week. The trouble is brought about by the small makers refusing to live up to the agreement and the big manufacturers propose to teach them a lesson by underselling them and driving them out of business.

The war will be started in the West and the eastern manufacturers will fall in line. It is predicted that profits will be reduced to a point where it will be necessary to cut down wages. If this is done there will probably be extensive strikes in the industry wherever it exists in the United States.

HARMON S. PALMER CO. GETS THE GOLD MEDAL.

At the rear of the Cement Pavilion, at the Louisiana Purchase Exposition, was a most interesting assemblage of exhibits in which Portland cement is the main factor. Most prominent was one of the three exhibits of the Harmon S. Palmer Hollow Concrete Building Block Co. A very noticeable sign said that Harmon S. Palmer is the originator of the hollow block industry and that the company will prosecute infringers. In the office of the company's exhibit at the Palace of Liberal Arts a formidable pile of original patents, which appeared to have been taken out in nearly all the countries where patents are granted, was shown.

The first catalogue ever issued for hollow concrete building blocks appeared in January, 1901, by H. S. Palmer and the second by the Harmon S. Palmer Hollow Concrete Building Block Co., in October, 1902. Since then the industry has made enormous strides and in many places is making serious inroads into the regular stone business. The great success of the Palmer company has had the unusual effect of producing considerable competition.

It looks as if this hollow concrete block will be one of the most serious competitors of stone. It has the advantage over stone of being more cheaply and easily laid, and the finished wall exactly resembles it. As to the material, Portland cement and sand, there is no question about that. It is no experiment and the strongest and finest brick masonry is that in which a Portland cement, such as these concrete blocks are made of, is used to bind the brick together. The other form in which Portland cement is the principal thing, the monolithic, or armored concrete construction, though giving splended and proved results, is not likely to come into such general use as the hollow building block system, for one or more reasons, the chief of which is that when erecting an edifice of armored concrete we have practically to put up two buildings. The first is a temporary one, the mould, into which the concrete is poured and rammed. This has to be quite a substantial structure to resist the pressure put upon it, for the concrete has to be well rammed to make a good job of it. When this work is well done there is nothing to beat it.

The Harmon S. Palmer Co. offers what it states is a very conservative estimate of the cost of the cement blocks, giving figures to prove that the blocks—each of which is equivalent to forty-two bricks—can be produced at a cost of less than 20 cents each. That the estimate is certainly "conservative" may be concluded by the fact that the price of Portland cement is put at $1.50 per barrel. What seems to be an important point, but which the company's catalogue does not appear to enlarge upon, is the fact that at the low cost of production a decorative effect can be had that can be had in no other system of construction work except at considerable extra expense.

In addition to the outside exhibit that was in the Mining Gulch the company had an important stand in the Palace of Mines and Metallurgy. The third was one of the outside exhibits of the Palace of Liberal Arts. This was a pavilion of the Palmer blocks.

The important part of this exhibit was the moulds, or rather the interchangeable plates which give different faces to the finished blocks. The great importance of an inexpensive and quick means of changing the pattern on the face of a block will be readily understood. If the block represents a natural, rough-hewn stone, it must have a definite pattern, and if this is not varied, the effect in the complete wall will be irritatingly monotonous. These mould face plates supply the means to put any pattern on the face of a block. The plates are of cast iron and those representing rustic stone work are moulded direct upon the natural or cut rock. These plates are not only easily placed in a machine, but the whole operation of changing from one to another is effected in a little less than three minutes.

The machine is adjustable to all sizes and angles of blocks required in general building construction, from 3 inches to 16 inches in width.

The company was quite satisfied with the results of exhibiting, and has had a gratifying success in placing machines and complete outfits in various parts of the country.

The Harmon S. Palmer Hollow Concrete Block Machine Co., Washington, D. C., received the highest award, the gold medal.

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THREE EASTERN FIRMS CONSOLIDATED.

It has been announced that the A. & M. Barnes Lime Company, the Chester Goodale Marble Company and the Berkshire Pressed Brick Company had been consolidated, and would after January 1 carry on business under the name of the Berkshire Hills Masons' Supplies Company, Pittsfield, Mass. This consolidation means that the business will be operated upon a large scale during the coming year. The president of the consolidated company is A. L. Barnes. The inventory of the Goodale quarry has already begun, and the Barnes Lime Company will take an account of stock about the first of the year. The electric road which is being installed by the lime company will transport all the marble and brick to the cars on the Consolidated road. Mr. Barnes will go to New York this week in order to complete arrangements for the new undertaking.

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THOMPSON OF THE HYDRAULIC RETIRES.

J. B. Thompson, who for thirty-four years has been an employe of the Hydraulic-Press Brick Company, St. Louis, Mo., retired from active service on Jan. 1. Mr. Thompson for the last fifteen years has been general superintendent, and as a reward and appreciation for his faithful services was presented with a handsome gold watch and chain by the officers and employes of the company. The presentation speech was made by H. W. Eliot, first vice-president, at the offices of the company, Missouri Trust building.

MADE SEVENTY-SIX MILLION BRICK LAST YEAR.

The last year has been a busy one for the Purington Paving Brick Co., Galesburg, Ill., and more brick have been turned out by the company than during any year in its history. The company has made a total of seventy-six million brick in that time and has sold something over that number. It is believed that this is the largest number of brick manufactured by any one firm in the country. When one considers the local price at which these brick sell, he can see that the product represents about three-quarters of a million dollars. A large proportion of this sum has gone for labor, freight and fuel. The industry is a gold mine for the railroad company, for these brick are shipped all over the country. The company is about to install a fine battery of four new boilers in plant No. 2. The Frost Manufacturing company is making these boilers. The plants are still running, save the one mentioned, and some shipments of building brick are still being made. The year has been a very prosperous one for the factory.

TELLS POTTERS ABOUT NEW CERAMIC SCHOOL.

The twenty-eighth annual convention of the United States Potters' Association adjourned sine die at Washington, D. C., Dec. 7, after electing the following officers:

President, W. E. Wells, East Liverpool, O.; first vice-president, Daniel Willet, Trenton, N. J.; second vice-president, Joseph Mayer, Beaver Falls, Pa.; treasurer, George S. Goodwin, East Liverpool, O.; secretary, H. A. Heffer, East Liverpool, O.

Director Arthur Arton Hamerschlag of the Carnegie Technical Schools, Pittsburg, Pa., at the banquet explained to Western potters the real intent of the ceramic department of the new school. The director said:

"It is our idea to provide such a course of instruction as will be beneficial to both operative and operator. We intend to supplement your practical training with scientific knowledge along ceramic lines. We also propose that when you send a boy who has served an apprenticeship in any branch of your industry, to return him to you not only a better boy morally, but in addition he will bring home with him a knowledge of why the clay works 'good or bad,' and in the latter case able to remedy the trouble. This is what we want to do for you, and all we ask in return is that you work with us to bring this end about."

PORTLAND CEMENT TO GO UP.

The Association of American Portland Cement Manufacturers at its second annual meeting held in New York, Dec. 14, decided to advance the mill minimum price of Portland cement in the spring to $1 per barrel and to further gradually advance the price during the year.

The following officers were elected for the ensuing year: President, John B. Lober; vice-president, A. F. Gerstell; treasurer, Ernest R. Ackerman; executive committee, C. F. Wade, E. M. Hagar, T. H. Dumary, S. H. Bassett, E. M. Young, W. H. Harding, S. G. Newberry, R. W. Lesley, W. R. Warren and D. McCool.

CORONA CLAY OUTPUT WILL BE INCREASED.

There will be an extension of the Corona (Cal.) Terra Cotta and Pressed Brick Company works, which will permit an output of four times the present capacity and increase the number of employes about three times.

Four additional kilns are to be built, one dry fan and two wet-pans to be installed and stiff-mud machinery will be added. Instead of confining their manufacture to pressed and fire brick the company will, with its new machinery, be in position to manufacture all kinds of clay goods, etc.

Steam will be done away with and new 80-horse power electric motors will take its place. The present building is to be enlarged by an 80x25-foot corrugated iron addition. So far only one contract has been awarded, and that to the Riverside foundry for the wet and dry pans.

COMMISSIONER MAYBURY IS ADVERTISING FOR BIDS.

The Detroit municipal asphalt plant having proved a success, Commissioner of Public Works Maybury is now taking active steps toward the establishment of a city brick plant, for which $50,000 was allowed. He is advertising for bids for a plant with a capacity of from 20,000 to 30,000 brick a day. As the city uses from 5,000,000 to 8,000,000 brick a year, a tremendous saving can be made by the establishment of a municipal plant, if the commissioner's first year's experience with an asphalt plant is any criterion on what can be done with a brick plant.

The cost of laying asphalt pavement under the new system has been so materially reduced that the commissioner's paving estimates for 1905, now being prepared, will call for more of that class of paving than ever before.

ABOUT 65,000,000 TURNED OUT IN THE NEW BRITAIN, CONN., DISTRICT.

The brick manufacturing season which has just closed has been a successful one. The officials of the Central Brick Exchange of New Britain, Conn., which controls ten large plants thereabouts, report that their yards have turned out 65,000,000 brick in the course of the season. The production has been considerably in excess of that for last year.

The shipments have been large, and about 30,000,000 brick now remain in the yards. It is expected that all these will be shipped by April, when the next season begins.

The Indiana Drain Tile Co., a $100,000 stock company, will build a plant at Brooklyn, Ind. J. M. Powell of Orestes, is president; J. F. Morris of Summitville, vice-president; S. Free of Alexandria, secretary and treasurer. They will use tunnel dryers and a continuous kiln.

LIME OR SAND BRICK OR BLOCK NEWS.

W. F. Peeler is now engaged as the superintendent of the Union Stone Brick Co., at Lafayette, Ind.

Adam Saal, Pekin, Ill., will enter into the field to make cement blocks, at a plant on South Third street.

Thomas Gimbert, Adrian, Mich., has leased the Davis building and has commenced turning out building blocks.

Red Wing, Minn., is to have a pressed brick plant. Wm. and Fred Busch, Chas. Betcher and J. Bovey are interested.

It is stated that negotiations are pending for the locating of a $100,000 sand-lime brick plant at Chattanooga, Tenn.

The National Sand & Cement Block Co., Plymouth and Detroit, Mich., has been incorporated with $50,000 capital stock.

Business men of Marion, Ind., are considering the location of a sand-lime brick plant. G. M. Elliott is interested in the deal.

The Semisteel Company of Cleveland, Ohio, have just closed with the Indiana Sand-Lime Brick Co. of North Judson for a three press outfit complete.

The Tulsa (I. T.) Cement Stone Manufacturing & Developing Co. has been incorporated with $20,000 capital stock, by C. O. Frye, M. A. Frye and Sam Weston.

A new sand and cement brick manufacturing company is being organized at Detroit, Mich. Horace S. Smith, D. M. Kennedy and C. F. Berry are interested in the new company.

The Warsaw (Ind.) Sand-Brick Co. has sold all the stock of their company except $10,000, and will soon be at work building their plant. A. W. Butler and J. S. Berkey are interested.

The Rochester (N. Y.) Composite Brick Co., 16 State street, has been organized with Homer Knapp, a contractor, as president, and Laurence Elkus secretary. The plant will be two miles from Sea Breeze.

The Manistee (Mich.) Brick Co. is the name of the new sand-lime brick company at that town. The building is now being erected and the plant is being constructed by the Robt. F. Wentz Eng. Co., 507 Hammond Bldg., Detroit.

The Sandy Hill (N. Y.) Brick Co's. secretary, Albert H. Perrigo, has made a visiting trip to several of the leading sand-lime brick plants in the east, stopping at Wilmington, Del., the home of the new secretary of the National Association.

The Evolution Brick Co. is the name of a new sand-lime brick company for Mexico City, Mexico. The capital stock is $125,000. Forty thousand brick will be made daily. C. M. Sandoval, of St. Louis, is the sole agent of Mexico for the process used.

The Wichita (Kan.) Sand & Mercantile Co. gets a charter with $75,000 capital stock. They have bought Ackerman's island for $20,000 and will expend about $60,000 in improvements. The officers are T. E. Lutgerding, president; L. W. Kellogg, vice-president; Joseph Tach, secretary, and A. C. Dickson, treasurer.

MISCELLANEOUS ITEMS.

A brick and tile company is being organized at Auburn, Iowa.

Arrangements have been made to remove the Addington Brick Works to Comanche, I. T.

The Ohio Clay Co., 148 South Howard St., Akron, O., contemplates the building of a sewer pipe plant.

The plant of the Blanford Brick & Tile Co., at Russell, Mass., has been sold and converted into a leatheret factory.

P. B. Broughton & Co., Bradford, Pa., have let the contract to rebuild their plant that recently burned at Lewis Run.

The Ohio Valley Sewer Pipe Co's. plant at Empire has been sold to the Stratton Fire Clay Co., who will operate the plant.

Andrew Anderson, manager of the Oakland (Neb.) Brick Mfg. Co., is visiting his old home in Denmark during the holidays.

The Atlas Brick Co., Allegheny, Pa., has been incorporated with $20,000 capital stock, by Joseph Hastings, R. R. Lambert and Edward Hough.

The Esterville (Iowa) Brick & Tile Co. have closed down their plant for the season and will be busy until spring making repairs and improvements.

The brick yard at Forestville, Wis., owned by Miller Bros., will add several improvements in the spring. Sand molds and a dryer will be put in.

C. J. Swanson, proprietor of the Northwestern Fireproofing Works at Fridley, Minn., has built a church on the property to give the people a place to worship.

The American Roofing Co., a $50,000 capital stock company, will in the spring build a clay roofing tile plant at Brazil, Ind., where four new plants are under consideration.

The Rayne (La.) Brick Co.'s plant, which has been run only half time, will be started up under the management of Capt. P. S. Schneider, of New Orleans, and operated at its fullest capacity.

The Iowa Brick Mfg. Co., Des Moines, has completed its extensive improvements. The plant is now a modern one, using waste head for drying and a Thew automatic steam shovel in the clay pit.

The Standard Brick & Tile Co., Ltd., Winnipeg, Manitoba, has been incorporated with $40,000 capital stock. They are now building a plant in Kildonan, just north of the city limits of Winnipeg.

The Witthoff Brick Co., Birmingham, Mo., which was reported six weeks ago as incorporated, has bought the plant of the Kansas City Shale Brick Co. and will have a daily capacity of 20,000 brick.

The Riverside Brick Co., Montgomery, Ala., are preparing to put in a new system during the spring months. This company was organized 18 years ago. Lorenzo Davis is the president and manager.

The Roseville (O.) Brick & Terra Cotta Co. recently elected the following officers: C. H. Ryland, president; J. W. Wigton, vice-president; J. A. Howell, a brick manufacturer of Toledo, secretary and treasurer. Plans are made for great improvements in the plant.

E. O. Syphers has sold his interest in the Milton (Ia.) Brick Co. to F. E. Campbell.

Scott Walters has made preparations to open a new brick yard on his land at Green Castle, Pa.

Geo. B. Tyler, Hastings, Neb., has bought machinery at Joplin, Mo., for a brick making plant.

Madden & Co., brick and tile machine manufacturers at Rushville, Ind., are considering the building of new shops of much larger size and up-to-date.

Herman Gerbsch, Wausau, Wis., is to put in a brick yard in the town of Stettin, near the old shingle mill. Most of the machinery is already on the ground.

The Cape Girardeau (Mo.) Press Brick Co., under the able management of A. R. Ponder, has just closed a very successful year, making over 4,000,000 pavers.

The St. Louis (Mo.) Clay Burning Co. has filed a deed of trust for $200,000. The money is to be used in improving the company's property at Maryland Heights.

J. M. Beale & Co., Pawpaw, Ill., have had the most successful year since they began business. They will build more kilns, a new dryer and put in additional machinery.

The Peerless Portland Cement Co., Union City, Mich., have just closed, making 300,000 barrels of cement in 1904. The remaining winter months will be taken up in repairs.

The Savage Mountain Fire Brick Co., Frostburg, Md., are extending their yard in order to increase their output one-third. They have been in the high-grade fire brick business since 1864.

The Standard Shale Brick Co., First and Abbott Sts., Detroit, Mich., has increased its capital stock from $40,000 to $60,000. J. C. Wilson is president and F. E. Jarvis secretary and treasurer.

The Ada (I. T.) Pressed Brick & Tile Co. has been organized with $24,000 capital stock. Tom Hope is president; J. F. McKeel, vice-president; John W. Beard, secretary, and Frank Jones, treasurer.

J. T. Dean has bought 60 acres of clay land 3½ miles west of Knoxville, Tenn., near Bearden, and will erect a $20,000 brickmaking plant. He is already putting up some cottages and digging a well for water.

The Union County Pressed Brick & Tiling Co., New Albany, Miss., has been organized with $25,000 capital stock. J. T. Baker is president, D. H. Hall vice-president and T. F. Baker, secretary and treasurer.

The Alex. A. Scott Brick Co., Knoxville, Tenn., capital stock $50,000, has elected the following officers: Alex. A. Scott, president and manager; J. F. Scott, vice-president; Alex. McMillan, secretary and treasurer. This company have bought 62 acres of land three miles west of the city.

The Millville (O.) Fuel & Clay Co. has been incorporated with $100,000 capital stock. They now have leases on 1,200 acres near Millville. The office will be at Columbiana, O. Jonathan Lower and John E. Allen, of Columbiana; Dr. O. A. Rhodes, of Lutonia; Chas. Madison, of Youngstown, and Chas. Dickinson, of Leetonia, are interested.

Dickson Bros., Franklin, Ind., will establish a tile yard at that place.

The Norfield Brick Co., Norfield, Lincoln Co., Miss., has been incorporated with $30,000 capital stock.

Martin & Mack, Eugene, Oregon, have completed arrangements to enlarge their plant to a great extent.

The Columbia Fire Clay Co., Washingtonville, O., have completed repairs and are now working at full capacity.

The Cordele (Ga.) Sash, Door & Lumber Co. will build a large brick works and add brick to its products for builders.

Gus Spannagel has bought the elevator, lumber and brick and tile business from Dixon & Shuping, at Hillsboro, Ill.

A. W. Mitterer, who recently bought the Gifford (Ia.) Brick & Tile Works, has traded them for Dakota land to Luther A. Devendorf.

The third annual banquet of the workmen of the Salmen Brick & Lumber Co., Slidell, La., took place Jan. 4th. Eight covers were spread.

The James Bay Railway Co., Toronto, Ontario, will build a brick works in the Don Valley of sufficient size to furnish brick for their own use.

The Marquis Clay & Limestone Co., New Castle, Pa., has absorbed the Pennsylvania Portland Cement Co., which is preparing to erect a $1,000,000 cement plant.

It is reported that the Michigan Alkali Co., which has a plant at Wyandotte, is to build a cement plant at Alpena, where they have a large deposit of lime rock.

The Union Brick & Machine Co., Boston, Mass., has been incorporated with $50,000 capital stock, by George L. Downing, president, and Edward A. Sawyer, treasurer, 48 Sudbury street, Boston.

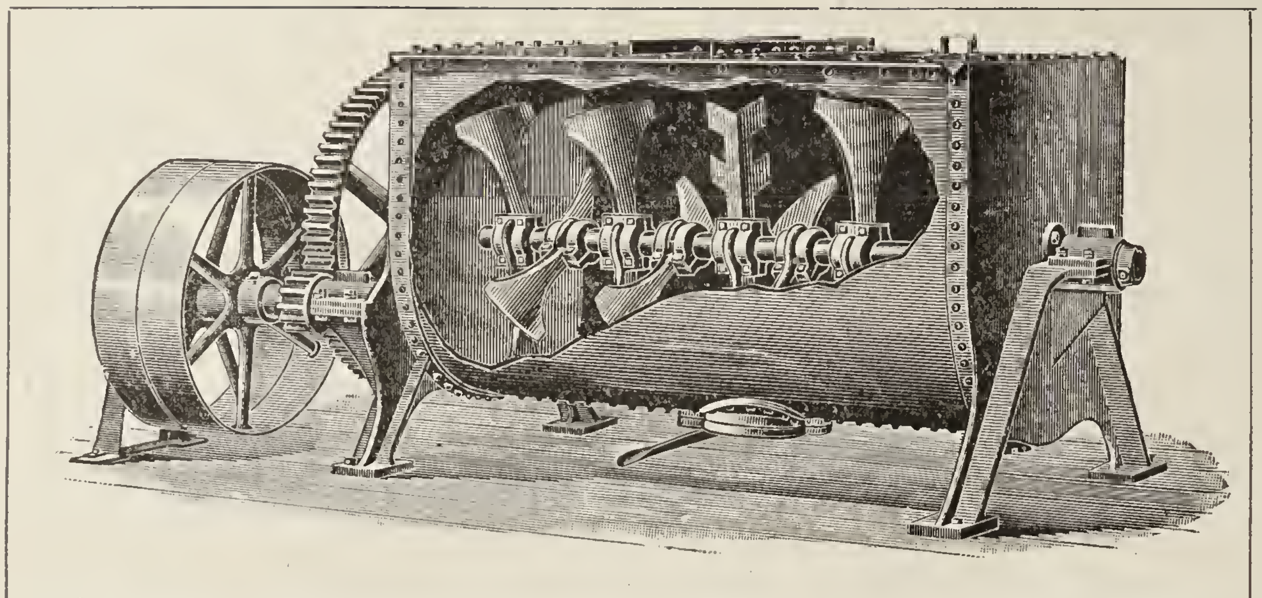
The United States Brick Co., Reading, Pa., has leased for 99 years the plant of the Perkiomen (Pa.) Fire Brick Co. The company is capitalized at $100,000 and the stockholders realize 6 per cent annually.

The Karthaus Fire Brick Co., Lock Haven, Pa., recently elected the following officers: Wm. C. Weaver of Hyner, president; D. I. McNaul, vice-president; P. L. Knecht, secretary and treasurer, and Rex Kyler, superintendent.

The Southern Fuel & Supply Co. and the Southern Tile & Artificial Stone Co., Jacksonville, Fla., has been consolidated under the name of the former company. J. K. Munnerlyn is president, and the office is at the foot of Hogan street.

The Waco (Ky.) Mining & Manufacturing Co. has been sold to Reynoldsville, Pa., capitalists, and a new $150,000 plant will be built. G. W. Lenkerd is the new president, and his brother will be the superintendent. The main office is at Lexington.

The Trenton (Mo.) Brick & Tile Co. held its annual election and elected the following officers: H. F. Hoffman, president; H. T. Mattern of Kansas City, vice-president, and G. M. Wolz, secretary and manager. Mr. Wolz was instructed to buy machinery at once for its new dry press plant.



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The C. O. Bartlett & Snow Co., Cleveland, Ohio, U. S. A.

C. K. WILLIAMS & CO.

EASTON, PA.

The Largest Manufacturers in the U. S.

BRICK AND MORTAR

COLORING

OF ALL SHADES.

Correspondence Solicited. Samples and Estimates cheerfully furnished on application.

MANAGER WANTED FEB. 1ST.

A party thoroughly acquainted with the trade in the Southeast, Southwest Kansas and Missouri territory. Must be a good salesman. Take charge of the sales department of a concern manufacturing cement plaster. lime and vitrified brick. Best reference from past and present employers required.

MANAGER,
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Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

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Good Brick and Tile Factory. Good clay, good railroad facilities, and good field especially for tile.

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White Glass Sand or Sand Brick Property, near St. Louis Mo.. Situated on two roads. All facilities. Switches on property. Address

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A small tile and brick factory in a big town. Cannot supply the demand. Could enlarge profitably. Best shipping point.

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Well equipped brickyard, stiff and soft mud manufactures plenty good clay with siding on C. P. Ry., 27 miles from Vancovers. B. C, Address

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FOR SALE.

50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets Track gauge 25 inches.
Both styles of cars in first-class repair.

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A second hand No. 2 Giant Auger Brick Machine. Address "GIANT,"
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1 Raymond Victor double die steam repress.
1 Raymond Columbian double die steam repress.
1 American Clay Working Machinery Co. Eagle double die steam repress.
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1 four-mold Boyd Dry Press, new.
All in thorough repair.

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FOR SALE—CHEAP—1200 Steel Crimped Pallets. 10x34 inches. Address

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$200.00 buys a Freese Combined Brick and Tile Machine and Pug Mill. Dies, Tables, complete, No. I. Good order.

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Four-Mold Dry Press, absolutely as good as new. made only one kiln of brick. Can sell for less than half original price. Address

"DEALER," care Clay Record.

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One C. W. Raymond Co. No 777 Brick Machine, with automatic down-cut cutter. Machine is in perfect condition; has only made one-half million brick.

DIAMOND BRICK CO.,
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Do Your Brick Turn White?

HERE IS THE REMEDY.

PRECIPITATED

Carbonate K.B. C.F.H. of Barytes

The only preventative for scum and discoloration on facing Brick and Terra Cotta; neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

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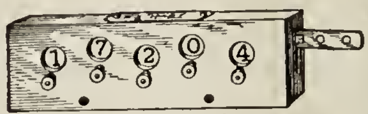

No better made, cut from $8 and $10, to
4 Wheel, $3.00
5 Wheel, $3.25
Guaranteed.
Sold by all dealers.

Paper Joggers quoted.
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A SPLENDID OPPORTUNITY.

A well-equipped brick yard, 24 miles from one of the best cities in the South which uses from six to eight million brick per year. One of Chambers Bros. large size machines, and disintegrator with pugging machine, two boilers and 80 h. p engine. 85 acres of land. Will sell all or a one-half interest. One-third cash, balance in brick at $5.00 per thousand at yard, as owner is a contractor. Address

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"We have *shattered* our previous records. Time of drying 21 hours; time of burning 12 hours."

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One second-hand brick and tile machine with dies complete. Capacity 20 to 40 thousand. One automatic end-cut brick table, one double die power repress. Must be in No. 1 condition and of recent make. Write us full description and lowest price. Address

BEN,
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A Four-Mold Simpson Press Brick Machine, in good condition, at your own price. Address

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One second-hand Grand Automatic Soft-Mud Brick Machine.
One Double-Geared Pug Mill.
One Potts Disintegrator.
One Wellington Mould Sander.
All for $350.00 to a quick buyer.

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FOR SALE.

Brick and Tile Mill, Ohio made, in good order. Address

BOX C, Jeffersonville, Ohio.

WHY EXPERIMENT

WITH

KILNS AND DRYERS

When you can secure same
at nominal cost from

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CONSULTING
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EDWARDSVILLE, ILLINOIS

Waste Heat Dryers and Up and
Down Draft Kilns **a Specialty**.

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Hydrate Your Own Lime

By the Cheapest and Best Process in Existence
Automatic from Begining to End

The only requisite being the weighing of each wheelbarrow of lime before dumping it into the machine.

The HYDRATOR, as the machine is called, will do the rest.

No grinding, no separating, no free lime.

The lime as it comes from the kilns is fed the machine, the powdered hydrate—freed from all impurities, flows from the discharge end.

The process is continuous.

The capacity from one to ten tons per hour, depending upon size of machine.

Especially adapted to sand-lime brick manufacture.

SEND FOR ILLUSTRATED CATALOGUE.

THE AMERICAN HYDRATING COMPANY
Baltimore, Md., or Delaware, Ohio.

A CARD TO THE BUILDING TRADE.

COPY OF ADD IN MUNICIPAL ENGINEERING, OCTOBER, 1904.

"We shall be pleased to meet you at our exhibit, Block 11, Mines and Metallurgy Building. Universal Exposition, St. Louis, where we can show you our NORMANDIN BLOCK MACHINE in detail. Our *Mr. W. W. White* is in charge assisted by our machine expert and demonstrator *Kirk H. Brown;* don't fail to call."

(Signed) Cement Machinery Co., Jackson, Mich.

COPY.

Circuit Court ot the United States, Eastern District of Missouri.

HARMON S. PALMER HOLLOW CONCRETE
BUILDING BLOCK COMPANY,
Complainant,
vs.
WILLIAM W. WHITE AND KIRK H. BROWN,
Defendants.

FINAL DECREE.

It is ordered, adjudged and decreed as follows:

1. That letters patent of the United States to Harmon S. Palmer, No. 727,427, 727,428 *Dated May 5th, 1903*, and 731,323 *Dated Juue 16th, 1903*, are good and valid patents * * * *.
3. That the Harmon S. Palmer Hollow Concrete Building Block Company, Complainant named in the Bill of Complaint herein, is the owner of all right, title and interest in and to said letters patent.
4. That the defendants herein, WILLIAM W. WHITE and KIRK H. BROWN, have infringed said letters patent * * * * and upon the exclusive rights of Complainant, HARMON S. PALMER HOLLOW CONCRETE BUILDING BLOCK COMPANY by making and USING machines embodying in their construction and method of operation the inventions covered by each of said letters patent.
6. That a perpetual injunction issued out of and under the seal of this Court, directed to defendants, the said WILLIAM W. WHITE and KIRK H. BROWN, their attorneys, clerks, agents, servants and workmen, and all claiming under or through them enjoining and restricting them and each of them from directly or indirectly making, USING or SELLING, machines * * * * embodying or employing said inventions claimed and patented by said patents, * * * *.
7. That Complainant DO RECOVER from said Defendants, WILLIAM W. WHITE and KIRK H. BROWN, the costs in this case, to be taxed, and that said Complainant have execution therefor against said Defendants.

(Signed ELMER B. ADAMS, Judge.
November 15th, 1904.

In view of the denial by the Normandin people that the Palmer Company had secured an injunction as claimed, and the further fraudulent claim that they owned certain interest in the Palmer Patents under a contract dated November, 1900, we deem it proper to inform the public, that neither W. F. Cowham, N. S. Potter or the Cement Machinery Company, own or control any portion of the H. S. Palmer patents. The paper referred to in their advertisement was an old option given at the time they bought one of the Palmer machines. The option was for thirty days and was never exercised, and was given to a proposed company which was never formed. The patents infringed by White and Brown, on the NORMANDIN machine were dated about three years later, May 5th, 1903.

HARMON S. PALMER HOLLOW CONCRETE
BUILDING BLOCK COMPANY,
Washington, D. C.

Automatic Improved DRYERS

ECONOMICAL—EFFICIENT—GREAT CAPACITY

For Clay, Coal, Sand, Marl, Etc.

AMERICAN PROCESS CO.
62-68 Williams St., New York.

ROBT. F. WENTZ ENGINEERING CO.
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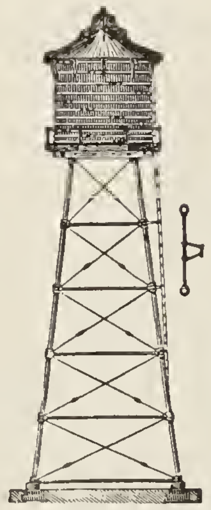
We have designed, built and reconstructed twenty two Cement Plants in the past twenty years

We design and equip complete Cement and Sand-Lime Brick Plants with the most modern machinery, apparatus and appliances developed by many years practical experience. Write, or call and see us.



Absolutely safe and reliable. *Ask your friends.*

A WOODEN TOWER

Is a source of annoyance and danger. It is liable to rot and collapse at any time. A

CALDWELL STEEL TOWER

is safe, staunch and durable and will carry four times the weight of the filled tank. Expensive labor is not necessary to erect these outfits, your own men can do it. We furnigh all plans.

Send for illustrated catalogue and price list.

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How to Use Portland Cement.

From the German of L Golinelli.
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A booklet of 30 pages, 5½x6½ inches.

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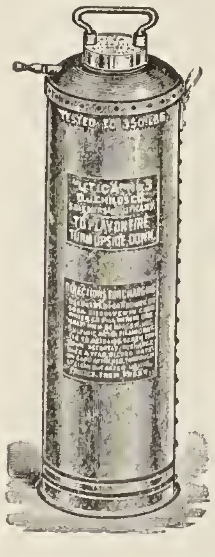
22,000 copies sold in Germany.

Portland Cement Sidewalk Construction.

Compiled by P. B Beery, and based upon the experience of many successful contractors.
A booklet of 30 pages, 5½x6½ inches.

PRICE, 50 CENTS.



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THE "UTICA"
FIRE EXTINGUISHERS
Without rubber hose is the
BEST AND SIMPLEST
FOR
HOMES AND HOSPITALS
Weight No. 2 loaded only 22 Lbs.

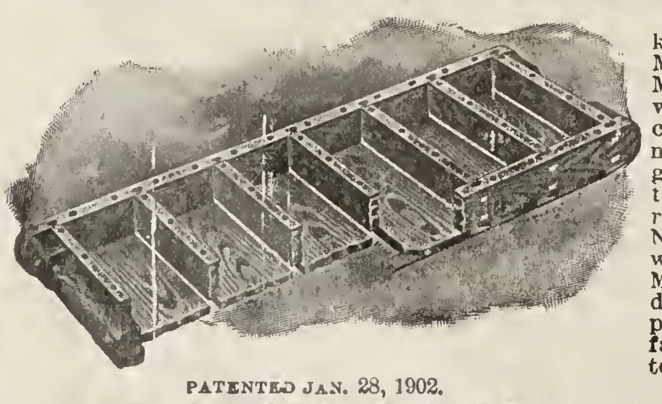
O. J. CHILDS CO.
Sole Mfgrs. - - - UTICA, N. Y.
SALESMEN WANTED

Brick Moulds and Brick Barrows

With Moulds and Barrows it is not the first cost, but it is, will they last? We have made them for over 30 years and know your wants. All kinds and shapes. A trial order will convince.

James B. Crowell & Son,
Wallkill, N. Y.

PERFECTION BRICK MOULDS



These are the kind of Brick Moulds the Brick Makers have always wanted but could not get till now. You can get a mould that the vents are right all the time No change whether the Mould is wet or dry. Try a sample order. Satisfaction guaranteed.

PATENTED JAN. 28, 1902.

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Manufacturers of Brick Machinery and Supplies of all Kinds. NEW LONDON, OHIO.

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Instruction given in the SCIENCE, TECHNOLOGY and ART of the CLAY-WORKING INDUSTRIES, BRICK, TILE, TERRA-COTTA, WHITE WARES, ARTISTIC POTTERY and PORCELAIN.

Tuition free to residents of the state of New York.
Catalogue sent on application.

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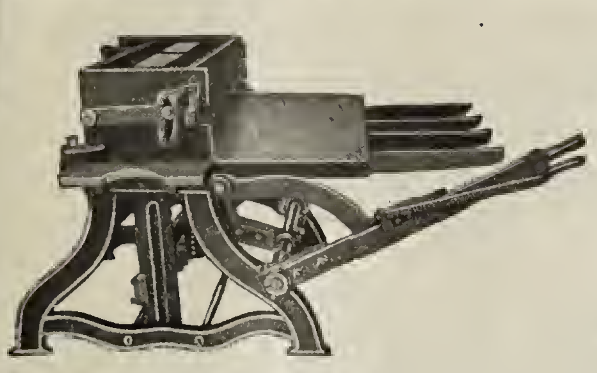
NORMANDIN CONCRETE BUILDING BLOCK MACHINES WIN!



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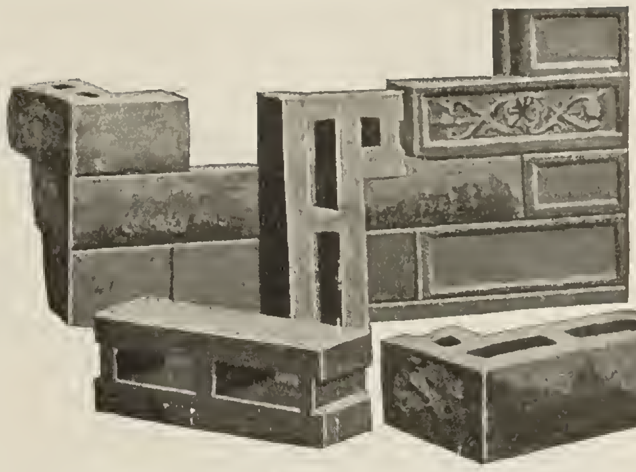
Get equipped with a Normandin and don't be handicapped, as this machine is complete and practical. Hundreds in use, thousands of Normandin Blocks used daily. Cheaper and better than brick or stone. The U. S. Government engineers, and the leading engineers, contractors, builders, cement workers and railroads have adopted and are useing the Normandin because it's right and superior to all others. **Investigate.** Normandin Blocks are in demand. Their manufacture is a permanent and profitable business.



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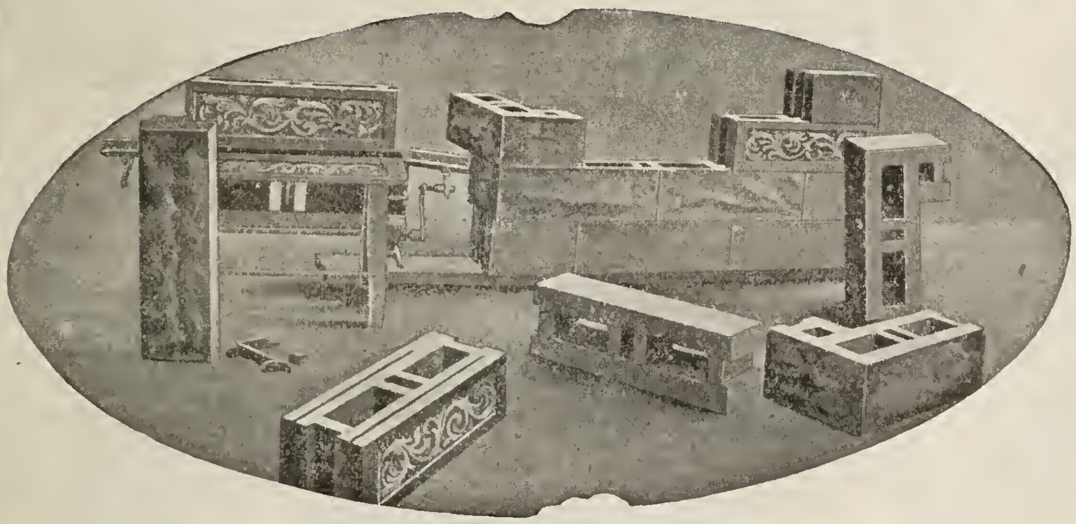
HOT FLOOR DRYING AND HEATING SYSTEM.

Heat your buildings, dry house, brick machine room, crusher room, engine room, or anywhere by the use of your waste steam from your engine and pumps. This can be done by our system of **HOT FLOOR HEATING** at about the cost of ordinary wood floor, and there is no pipes to buy, no nightman to pay, no coal to burn. We will furnish plans for the Hot Floor Heating System at small cost, and any man can put same in working order. Our 25-horse power engine will furnish heat from the exhaust steam while doing its own work for double the heating floor that is needed for the capacity of 25-horse power. Other sizes in proportion. Patent applied for. It costs you nothing for heat and you can run the year around. Address

ROBERT GOODWIN, JR., - Redfield, Iowa.



PALMER'S HOLLOW CONCRETE BUILDING BLOCKS.

Harmon S. Palmer, the originator of the Hollow Concrete Building Block System, has the only up-to-date machine that makes all blocks required in the industry.

DON'T BUY IMITATIONS and be subject to injunctions. The U. S Courts have given us injunctions against **FOUR DIFFERENT PARTIES** and sustained the validity and ownership of our patents.

We sell machines with or **without territory** and agree to **prosecute infringers. No other machine can offer such protection.**

Hundreds of papers in different towns are giving us unsolicited praise for the **national economy of our invention,** which others would be glad to appropriate.

HARMON S. PALMER CO., Washington, D. C.

WHY MAKE YOUR OWN BRICK CUTTING WIRES

When You Can Buy Ready Made Cheaper?

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The Lehigh Valley Railroad Co. is about to open a new territory in the New Jersey Clay Belt. Very desirable locations are offered to manufacturers of Clay and Kaolin products.

For information address
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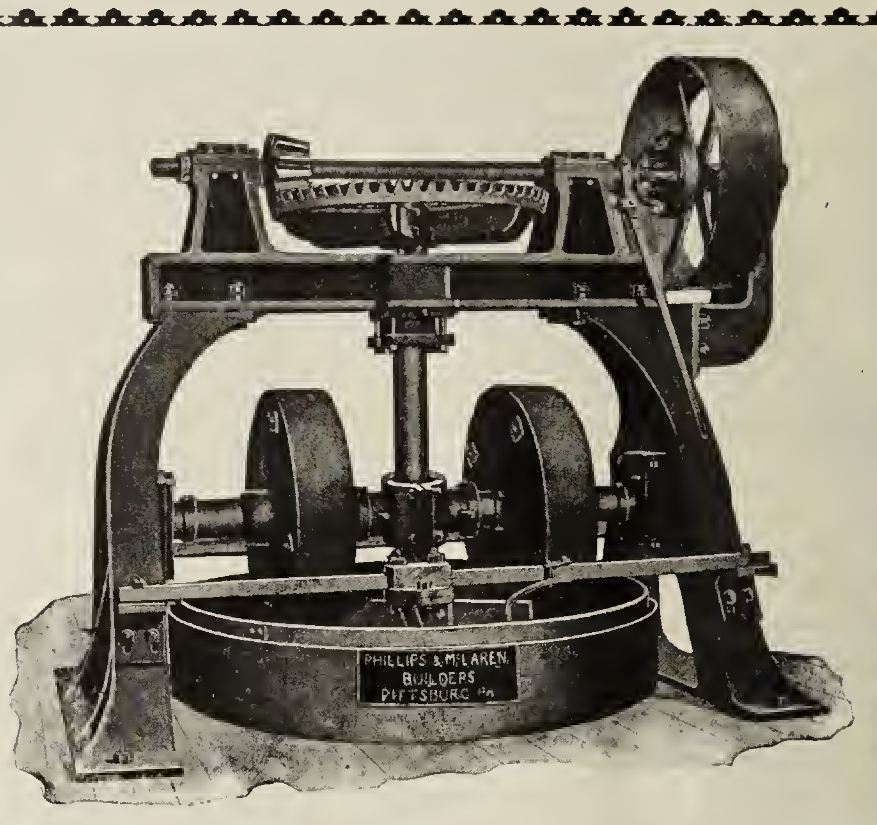

Grinding Pans—Dry and Wet

Tell us kind of material and capacity you have and we will quote you accordingly. We make **CRUSHERS** also.

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We have many Locations for Pottery, Tile and Brick Plants, with splendid Deposits of Kaolin and Clays of nearly all kinds needed by such Plants, Fluorspars, etc. We need good Potteries in the most economic districts for manufacturing and more Tile and Brick Plants to meet the demand for their products.

A correspondent in a good Alabama town desires a man to take charge of an up-to-date Brick Plant. It is in a section of country which will readily take the entire product.

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UNDEVELOPED DEPOSITS

KAOLIN—Pure, white and free from grit.
OCHER—Red, brown and yellow, of superior grades and quality.
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These deposits are located advantageously for working, reaching the principal markets, with cheap rates and best of transportation facilities. They can be purchased cheaply and on easy terms. For additional information, write

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Ask for a copy of Seaboard Magazine of Opportunities—it's free.

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The above plant is located on the C. & N. W. R. R. and has its own side track. It owns 20 acres of shale clay and fire clay and the clay on top of the shale is used to make drain tile. The shale clay makes a fine mottled face press brick and crossing and sidewalkbrick. At the present time we are unable to supply all the orders for pressed brick. The machinery consists of one 4-mould Simpson dry press, one 8-foot dry pan with elevator and track to clay bank to convey clay direct to chute connected with dry pan, one 65 h p. slide valve engine 14x24, one 80 h p. 60x16 full front, one hot water tank and steam pump, one Brewer tile machinery and crusher, 4-track hot air tunnel dryer and 50 dry cars, and single and one double transfer car, 8-foot fan driven from 15 h p engine to take the waste heat from the cooling kiln to dry the brick or tile, also one hot floor dry house 44x108 feet heated with exhaust steam from engine to dry the tile, and 4-round down draft kiln 24 feet inside with 55 foot stack in the center This is the only plant in town and there is a home market for all the tile it can make. There is also always a good demand for press brick The reason for selling is poor health. It will pay you to investigate. Address

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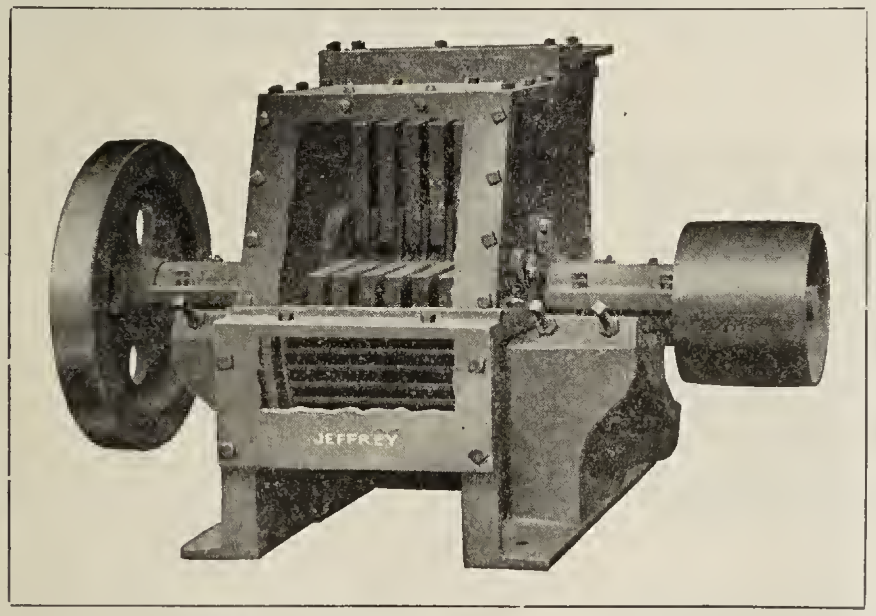

SUCCESSFULLY CRUSH

SHALE, LIMESTONE, BRICKBATS,
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A Few Features that Place

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Accessibility of Working Parts, Substantial Pillow Blocks, Simplicity in Changes of Parts, Material Partly Crushed in Suspension.

Catalogue 30 on Pulverizers Mailed Free.

THE JEFFREY MFG. CO., COLUMBUS, OHIO, U. S. A.

Elevating-Conveying-Power-Transmitting Machinery.

WHY NOT

Add a Stone Factory to Your Brick Plant?

Change Your Idle Days from a Loss to a Profit.

OUR PORTABLE HOLLOW CONCRETE BUILDING BLOCK MACHINE

Is the BEST, FASTEST, SIMPLEST and CHEAPEST on the market.

1 Man Can Make 200 Blocks Per Day

No carrying off blocks, consequently no loss by breakage, no expensive iron pallets, no cogs, gears, springs or levers, but it does the business.

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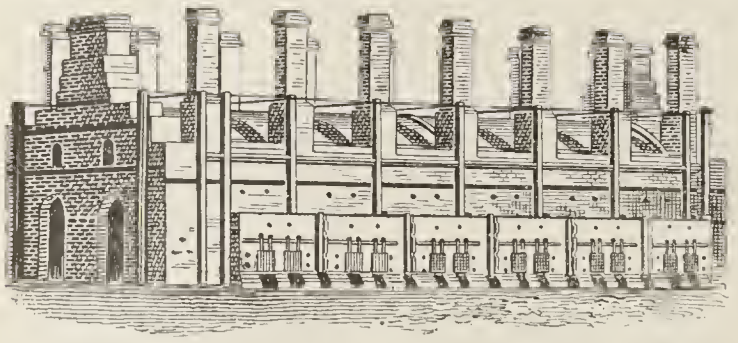
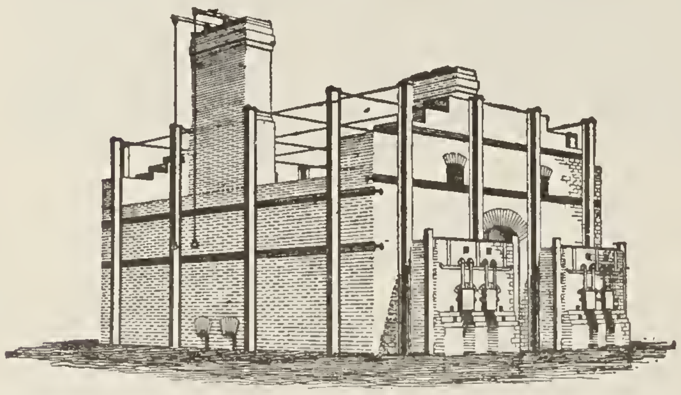


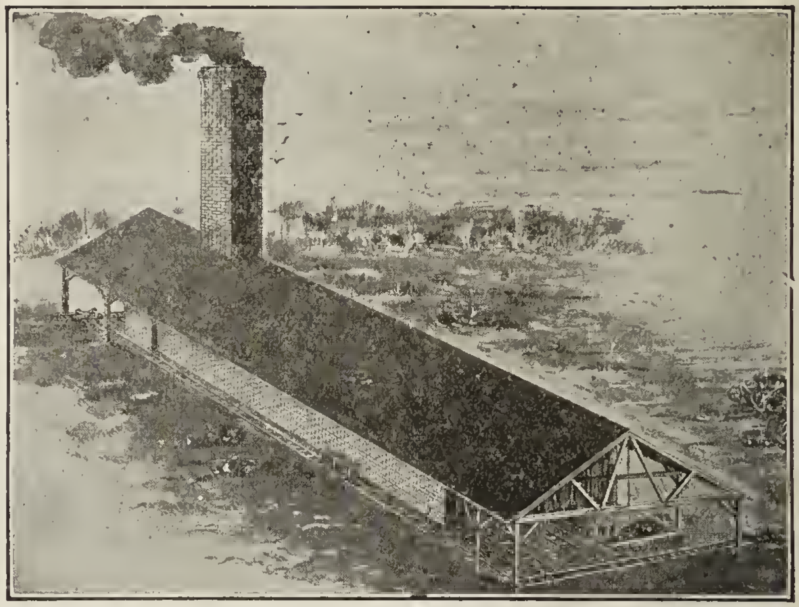
Improved Kilns, Square, Round and Continuous, End or Side Fire, Hot Air and Steam Tunnel Dryers, Steam or Hot Air Dry Floors, Test Kilns any Size.

REPRESENTATIVES WANTED.



Build the best; it is the cheapest in the end.

Hot Air or Waste Heat Dryer.



Brickmakers' Engineers.

Designers and Builders of Brick Plants.

Wilson Kiln & Dryer Co.

THOS. M. WILSON, Manager.

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Erie Railroad Chicago to New York

The Erie Railroad Company's Industrial Department has all the territory traversed by the railroad districted in relation to resources, adaptability, markets and advantages for manufacturing, and can advise with manufacturers in relation to the most suitable locations. The information furnished a manufacturer is reliable and has practical bearing on the nature of his particular industry.

Vast deposits of anthracite and bituminous coal, oil, natural gas—fuel is the paramount factor in manufacturing—sewer pipe, fire and other clays, cement material, gypsum, building stone and numerous other resources exist on the line.

It is important in this age of modern facilities for manufacturers to locate where they can obtain side tracks so as to receive from and ship directly into cars at the factory. Information can be promptly furnished in this connection about every point on the system between New York and Chicago.

The undersigned will be pleased to furnish full information to manufacturers and local parties contemplating the establishment of new industries.

Address, LUIS JACKSON
Industrial Commissioner
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FOR ALL USES.
LUMP, GRAIN AND GROUND
60-70% 70-80% 80-90% OXIDE.
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ON THE LINES OF
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SAND=LIME BRICK

THE BEST MONEY-MAKER IN THIS COUNTRY TODAY.

Plants installed complete on the AMERICAN SYSTEM, equipped with AMERICAN MACHINERY, started and operated until 100,000 brick are made. Quality Guaranteed. No Failures. No Experimenting. No Royalties. No Secrets. No Chemicals.

Send for Free Booklet.

NEW YORK OFFICE: 39 Cortlandt St.
SAN FRANCISCO OFFICE: 501 Rialto Bldg.
SOUTHERN OFFICE: City Bank & Trust Co. Bldg., Mobile, Ala.

American Sand-Lime Brick Co.
Great Northern Bldg., 77 Jackson Blvd., CHICAGO, U. S. A.

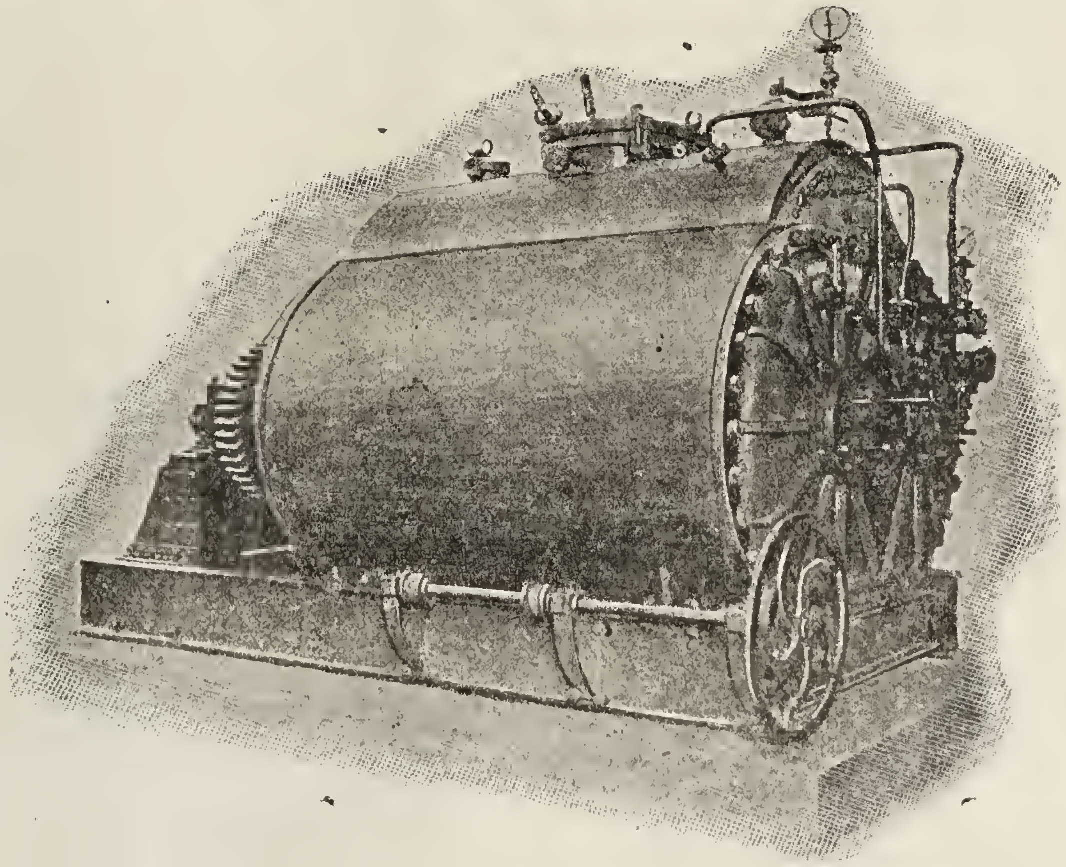
SAND-LIME BRICKS

Sand-Lime Brick Engineers
and
Builders of Special Machinery
for the Sand-Lime
Brick Industry.

Factories erected, equipped and put in running order under Full Guarantee.

We invite inspection of our plants.

SCWARZ SYSTEM BRICK CO.
8-10 Bridge Street :: NEW YORK



TALLEST SAND-LIME BRICK BUILDING IN THE U. S.
BRICK MADE ON OUR SAMSON PRESSES.

SEMISTEEL CO.

ENGINEERS AND FOUNDERS

701 New England Building
CLEVELAND, OHIO

Sand-Lime Brick

Plants Erected of any Capacity

Have you any Sand?

If so, you need what we have.

Our System is used by the first Sand-Lime Brick Plant in the United States, and has been in continuous operation and has produced and sold more brick than any other single plant.

Send for information. We have equipped plants in all parts of the United States. We do not use cement or chemicals, and do not sell patent rights.

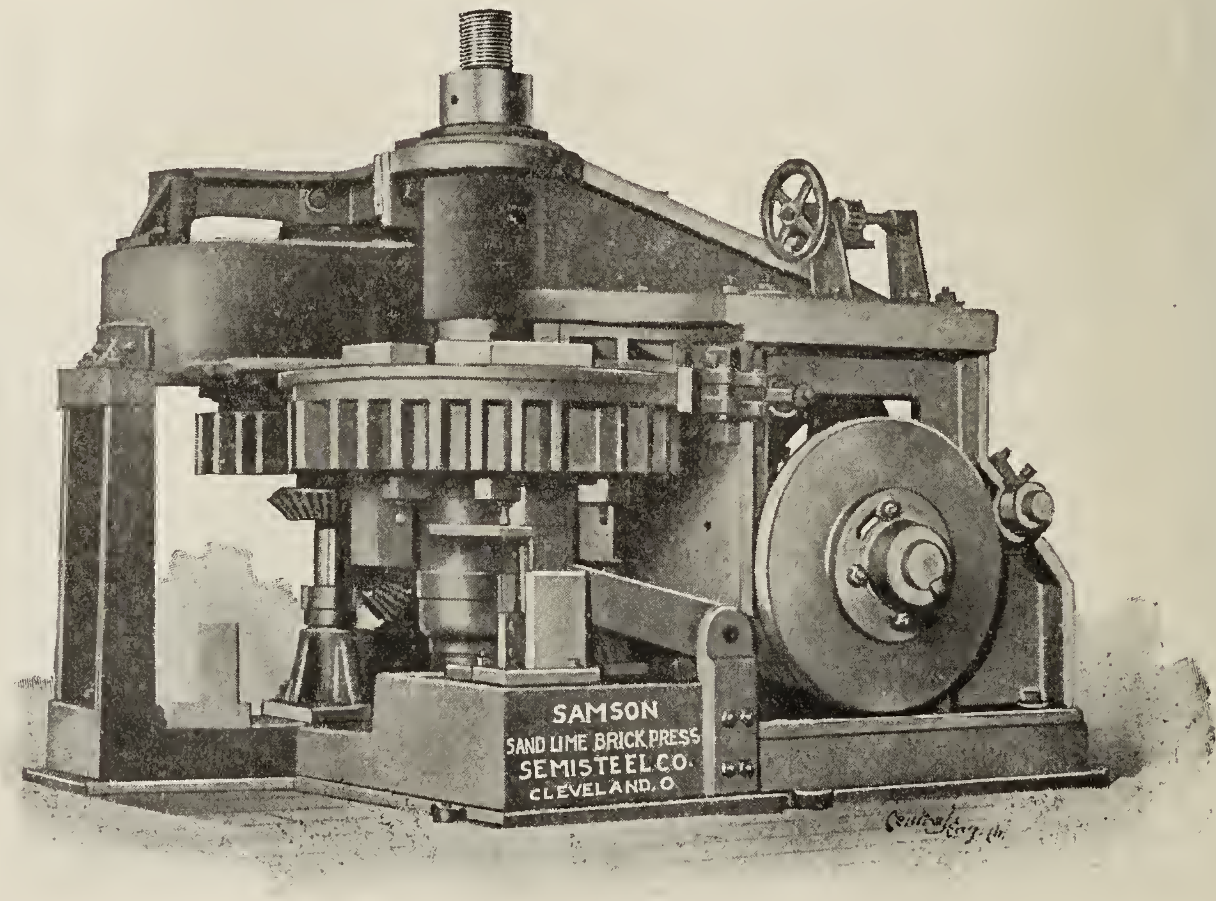
SEND FOR FREE BOOK.

We are not brokers, but operate our own foundry and machine shop.

WE MANUFACTURE

Special Sand Brick Presses
Hardening Cylinders
Sand Mixers
Sand Dryers
Conveying Machinery
Brick Cars, Transfer Cars
Elevators
Steel Castings
Manganese Steel
Cast Iron, Nickel Steel

SEMISTEEL CO.
701 New England Building
CLEVELAND, - OHIO



"Huennekes System"

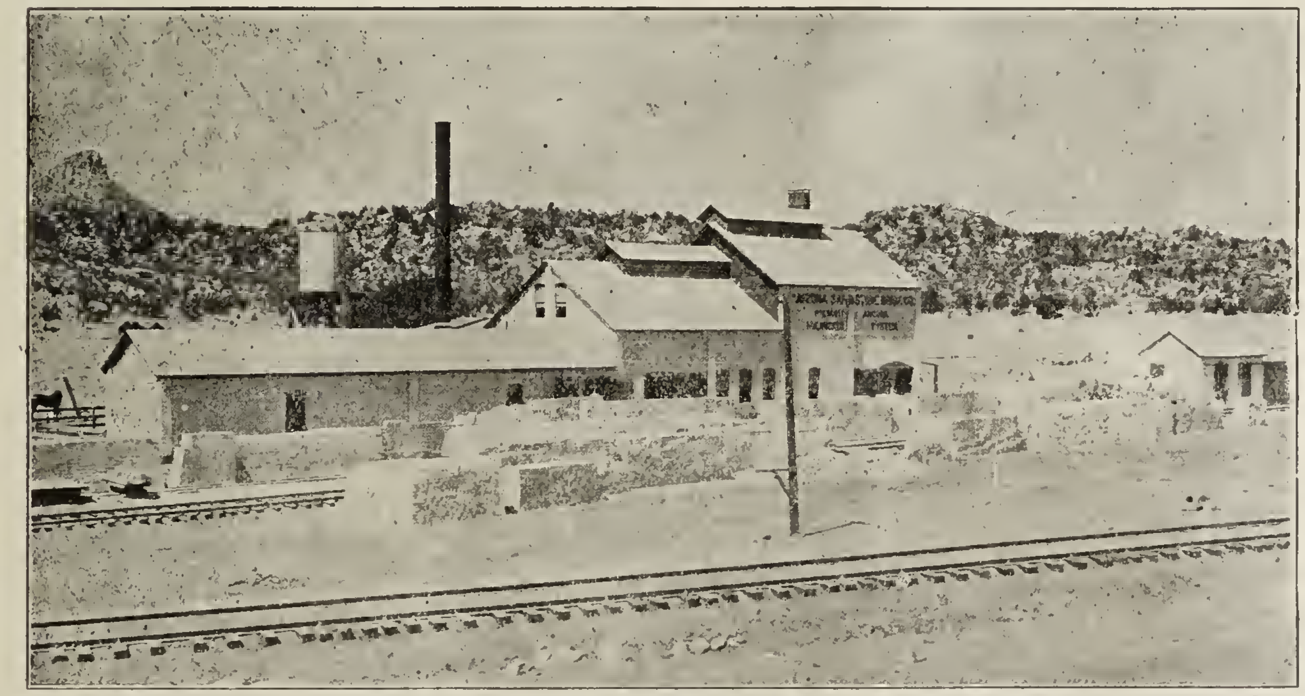
SAND-LIME BRICKS AND BLOCKS

25 Factories Designed, Equipped and Set in Operation During the Past Year in the United States and Canada.

OUR RECORD: Combined capacity of factories in 1903, 15 million bricks per annum.
Combined capacity of factories in 1904, 150 million bricks per annum.

Received from the Jury of Awards at the Louisiana Purchase Exposition the highest award for excellence of sand-lime brick.

U. S. Company's Quarters Whipple Barracks, Prescott, Arizona, Erected Out of "Huennekes System" Sand-Lime Bricks



Factory of the Arizona Sand-Stone Brick Company, "Huennekes System," Prescott, Arizona, Finished in Bricks of Their Own Manufacture.

"THINK THIS OVER."

Before the expiration of this year the total combined capacity of the factories erected and operated under the "Huennekes System" will be about 300 million bricks per annum—or a growth of about 2,000 per cent in one year.

Remember the doubts and scoffings about the "dry pressed brick" but a few years ago and the money made by the pioneers in this business.

The Sand-Lime Brick Business is to day in the identical state as the dry pressed brick business was but a few years ago.

All of our special machinery is manufactured in the United States by the foremost machine shops in their particular line of business, and are thoroughly tested, insured and guaranteed before leaving shops. All special machinery, as well as our methods and process are fully protected and covered by United States Patents. **Without the use of the same it has proved impossible to produce a high grade brick out of sand and lime in a commercial way at a low cost. The rapid growth of our business from 15 million brick per annum in 1903 to 150 million brick per annum in 1904** is not only a proof of the merits of the "Huennekes System." but also of the product itself.

Send for free booklet, tests and testimonials.

The original, oldest and only experienced Engineering Firm in the Sand-Lime Brick Industry.

H. HUENNEKES COMPANY

Engineers and Contractors for the
Erection of Sand-Lime Brick Factories.

MAIN OFFICES:
114-118 Liberty St., NEW YORK, N. Y.

SHALE FIRE CLAY

OUR SUBJECT MACHINERY

Covers a line of **PRESSES** and **PANS** for making

SEWER PIPE FIRE PROOFINC DRAIN TILE

Also Tuyeres, Sleeves, Nozzles, Runner Brick for Bessemer Steel process.

Write for prices stating your requirements.

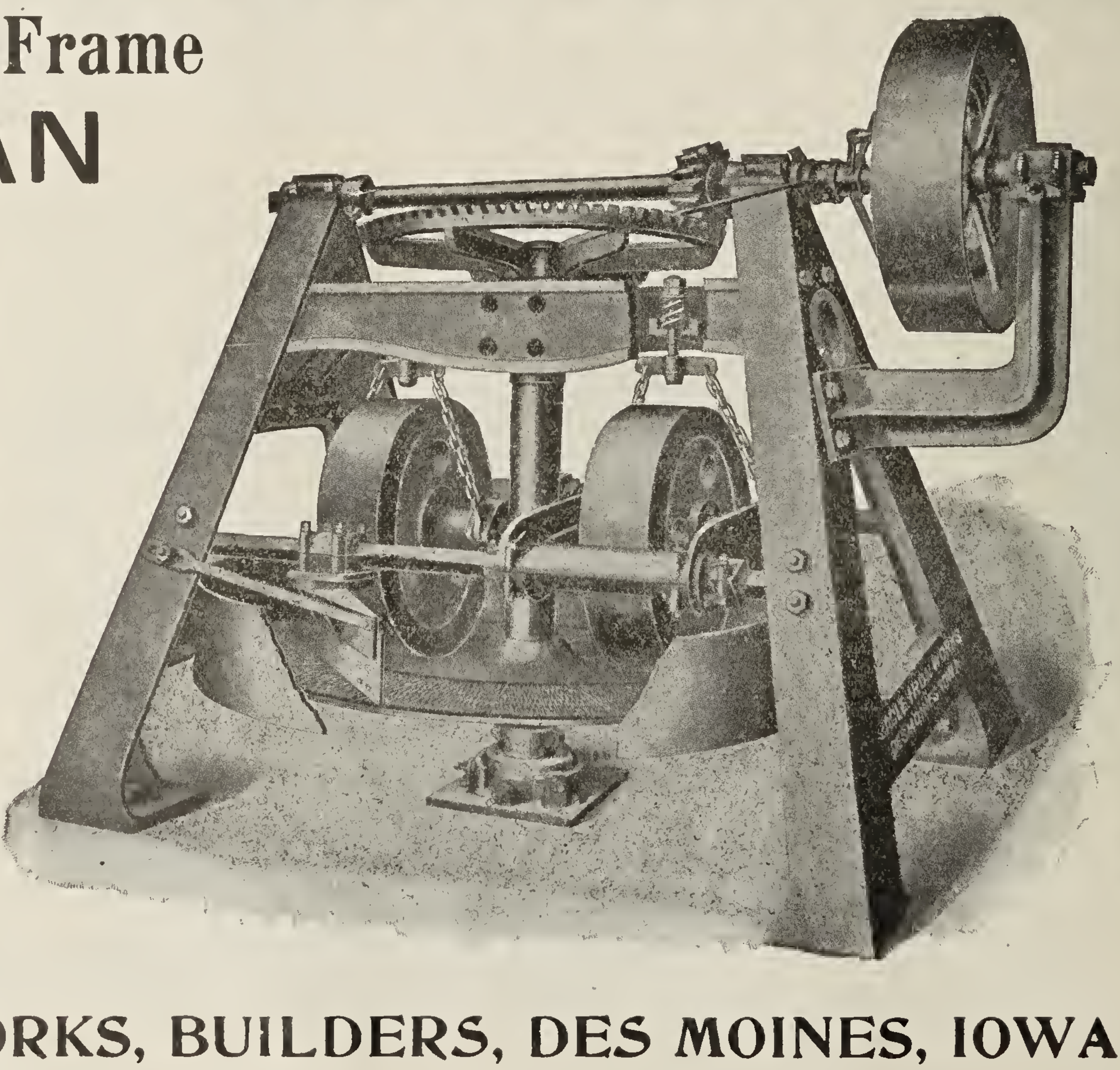
THE TURNER, VAUGHN & TAYLOR CO.
CUYAHOGA FALLS, OHIO, U.S.A.

Nine Foot Iron Frame
DRY PAN

With Independent and Suspended

MULLERS

A well-tried and proven Success.



EAGLE IRON WORKS, BUILDERS, DES MOINES, IOWA

ORDERS FOR PERFECT CLAY SCREEN

are proving our claims, as our record of sales for one week are fifteen screens. Thirteen of these were for old customers while two were for new ones. If our old customers were so well pleased, why can we not do as much for you?

If you use a screen we claim we can save you money by using ours.

DOES NOT THIS RECORD OF SALES PROVE OUR CLAIM.

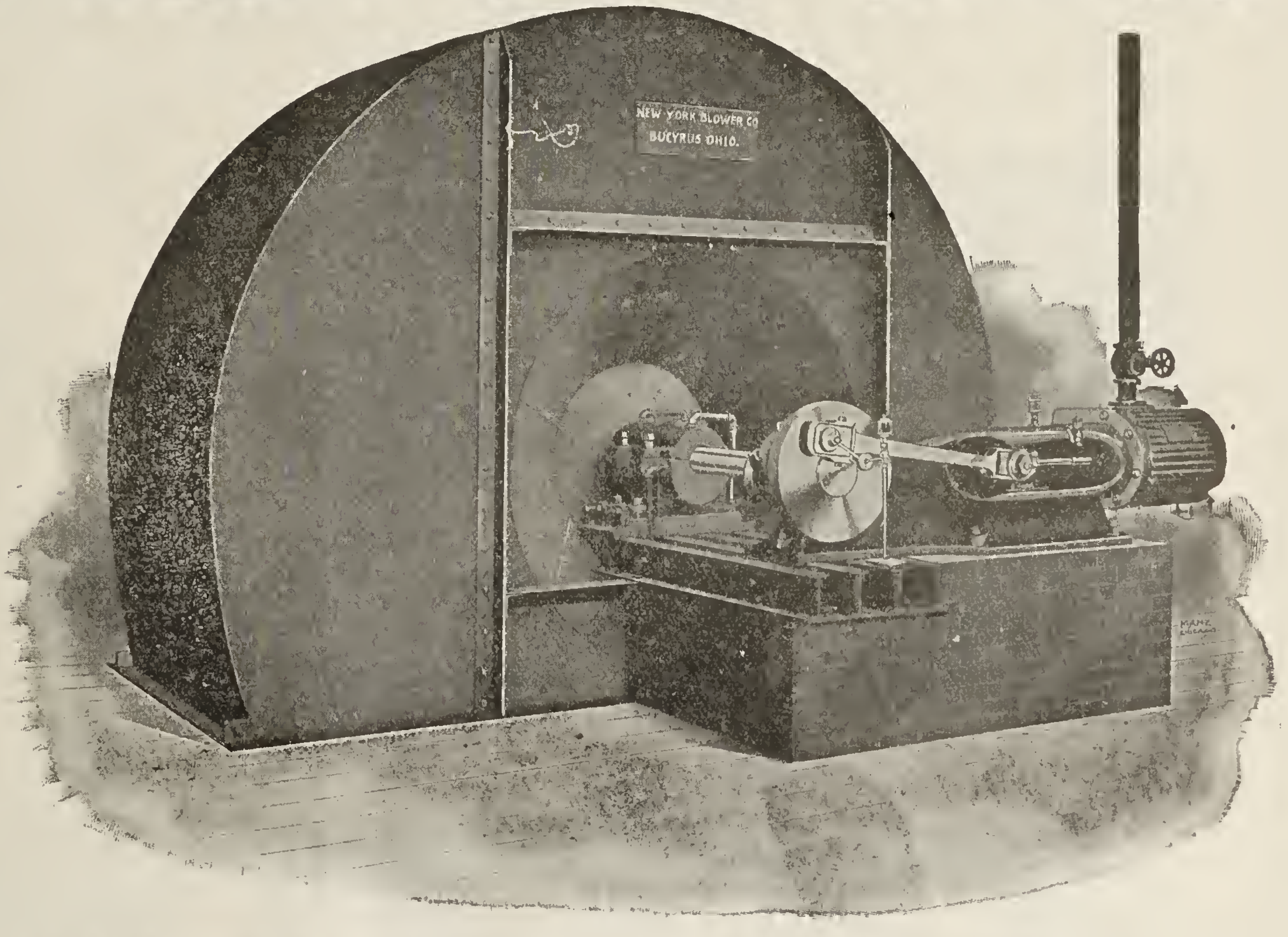
We guarantee satisfaction, let us show you what we can do. Our new catalog for the asking.

DUNLAP MFG. CO.,

BLOOMINGTON, ILL.

WASTE HEAT CLAY DRYER.

We offer the New York Blower Company's Improved Waste Heat Dryer as the most successful means of utilizing the heat from the cooling kilns which is at present an absolute waste. The two important factors in drying are heat and circulation of air; one being as important as the other. These are both amply provided for in our dryer. By the use of mixing chamber, provided with the proper dampers fresh air can be admitted to the fan to reduce the temperature of the incoming gases to the proper degree. By changing the speed of the fan the amount of air blown into the tunnels is easily regulated. With this apparatus, by which you can readily regulate and control the heat and circulation, you have a dryer which will work successfully in all climates and temperatures. The necessity of perfect circulation in a dryer should never be overlooked. With this end in view we provide additional circulating devices in our largest dryers. This maintains an even and positive circulation throughout the dryer and insures the successful drying of your brick.



CHICAGO OFFICE
25th Place and Stewart Avenue.

EUROPEAN OFFICE:
Cathedral Corner, Fennel Street,
MANCHESTER, ENGLAND.

NEW YORK BLOWER CO.
BUCYRUS, OHIO.

THE BRICK MAN

who makes a success of his business is the one who is always alert and who does not fail to investigate and adopt the improvements being made by others in his line.

We are constantly making Dryer improvements for other successful brick men. Why not let us make some for you?

IT PAYS TO BE PROGRESSIVE.

L. E. RODGERS ENGINEERING COMPANY

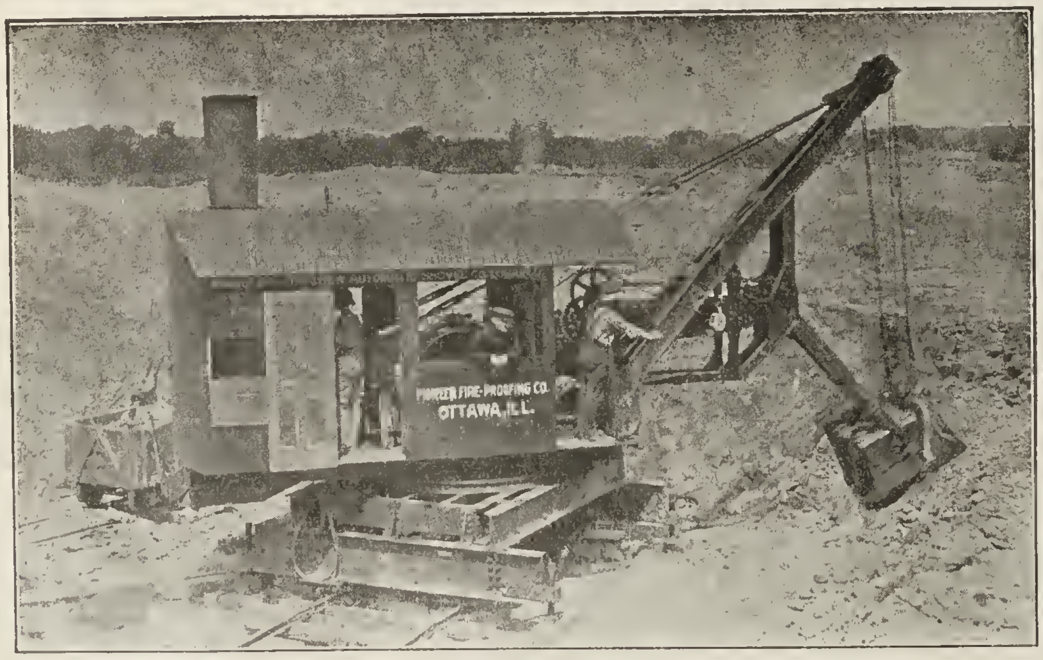
WASTE HEAT DRYER SPECIALISTS

303-305 Dearborn Street, CHICAGO

HANDLE YOUR CLAY WITH ONE MAN AND

The Thew Steam Shovels

Made In Four Sizes. Mounted on Car Wheels or Traction Wheels.



Type No. 2 Shovel—Pioneer Fireproofing Co., Ottawa, Ill.

Especially adapted for brickyard requirements. The shovel operates in a complete circle, enabling material to be delivered at side or in rear at will. The Dipper is hung from a horizontally moving carriage and can be adjusted to cut to any desired level.

: : Only One Operator Required.
Wire Cables used instead of Chains.
Strictly First-Class in Every Detail.

Economical for brickyards 30,000 to 40,000 daily capacity.

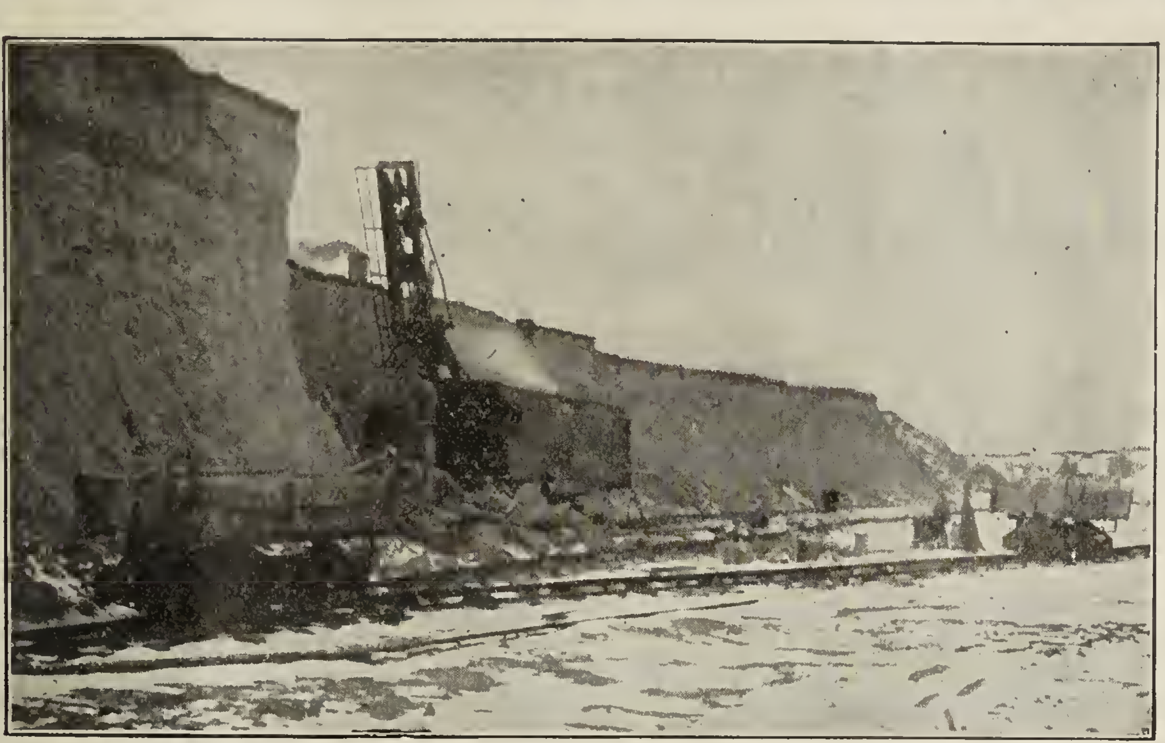
Operated by one man for outputs up to 125,000 brick per day.

Write us for Catalogues and Information.

THE THEW AUTOMATIC SHOVEL CO.,

LORAIN, OHIO.

ELECTRIC CLAY HANDLING SYSTEM



Car Approaching the Shovel from Return Track.

We transport clay from the shovel to the plant, operated automatically and controlled entirely by the man at the hoist. A system that will save its cost in labor in 18 months, as it eliminates all labor between shovel and plant. Power to generate the electricity taken from any driving shaft. We invite personal inspection of plants in operation.

Patentees and Manufacturers of Automatic Machinery and Devices for Handling Clay, Coal and other material.

HAUSER COMPANY

GENERAL AND ELECTRICAL CONTRACTORS 271 MADISON ST., CHICAGO

Power Construction and the Design and Equipment of Modern Clay Working Plants.

National Brick Manufacturers' Association

ANNUAL MEETING

Birmingham, Ala., January 30th-February 11th, 1905. Special Low Rates. Best Service. Via Cincinnati, Chattanooga and the

"QUEEN & CRESCENT ROUTE"

FOR FULL PARTICULARS ADDRESS

W. A. BECKLER, Northern Pass. Agent

113 Adams Street, Chicago
Phone Central 1682

National Association
Brick Manufacturers' Convention

BIRMINGHAM, ALABAMA

January 31st to February 4th, 1905

$26.35

FOR THE ROUND TRIP

Your trains leave at 1:15 P. M. and 7:00 P. M. from the **La Salle Street Station on the Elevated Loop, Chicago**, one to six blocks from all the leading hotels in the heart of the city and arrive in Birmingham at 8:25 A. M. and 3:30 P. M. respectively. Through Sleepers and Dining Cars.

Ticket Office, 91 Adams Street Phone Central 4446

FRISCO
SYSTEM

CHICAGO & EASTERN ILLINOIS R. R.

The Birmingham, Ala.,

CONVENTION

Conveniently reached from Chicago
and the Northwest by taking the

MONON ROUTE

C. H. & D. Railway

By way of Cincinnati and through the
Cumberland Mountains by daylight.

Meet the Eastern Contingent at Cincinnati

Leave Chicago	9:02 P. M.
Arrive Cincinnati	7:40 A. M.
Leave Cincinnati	8:30 A. M.
Arrive Chattanooga	6:15 P. M.
Arrive Birmingham	10:20 P. M.

Sleeper from Chicago.

Dining Car and Observation Car from Cincinnati.

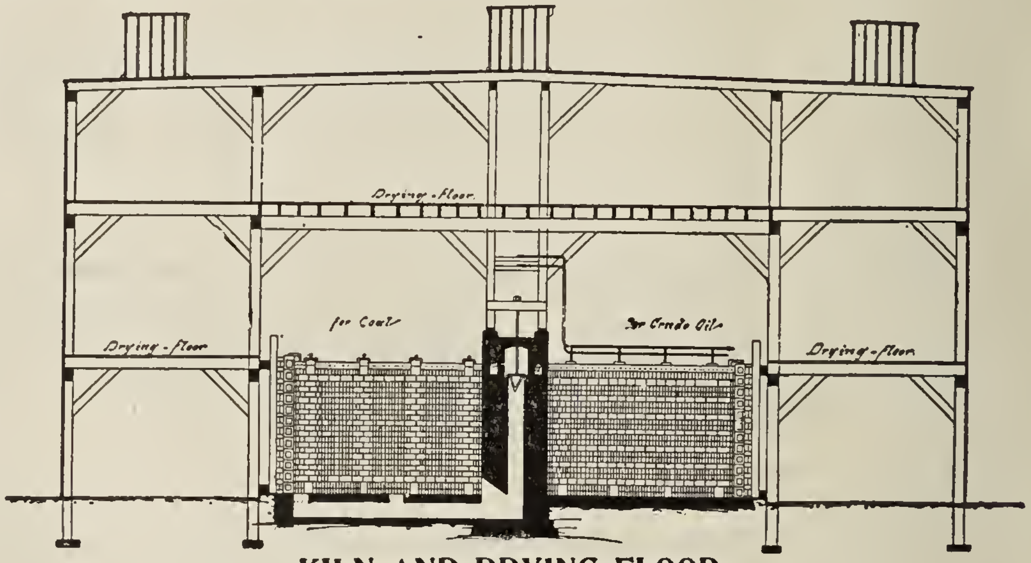
Have a good night rest at Birmingham and be fresh for the Convention in the morning. For rates and full information address

BURT A. REEVE,
T. P. A. MONON ROUTE
232 Clark Street, CHICAGO

Lehmann Portable Continuous Kiln in Combination with Drying Floors...

CHEAPEST AND SIMPLEST CONTINUOUS KILN ON THE MARKET

Can be constructed ready for work in six to eight weeks, and adapted to all kinds of fuel. Saves 65 to 75 per cent. on fuel as compared with up-draft or down-draft kilns. Drying is done by heat escaping from kiln without extra expense, gradually, uniformly and thoroughly. Goods are handled by automatic delivery elevators, and cost of handling, drying and burning is reduced to a minimum.



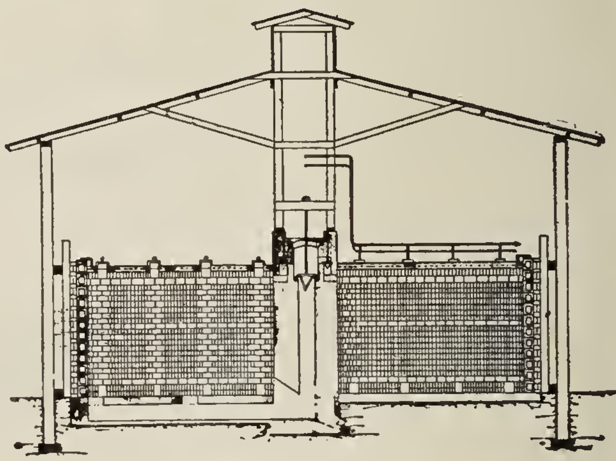
KILN AND DRYING FLOOR.

Lehmann Crude Oil Burning Apparatus

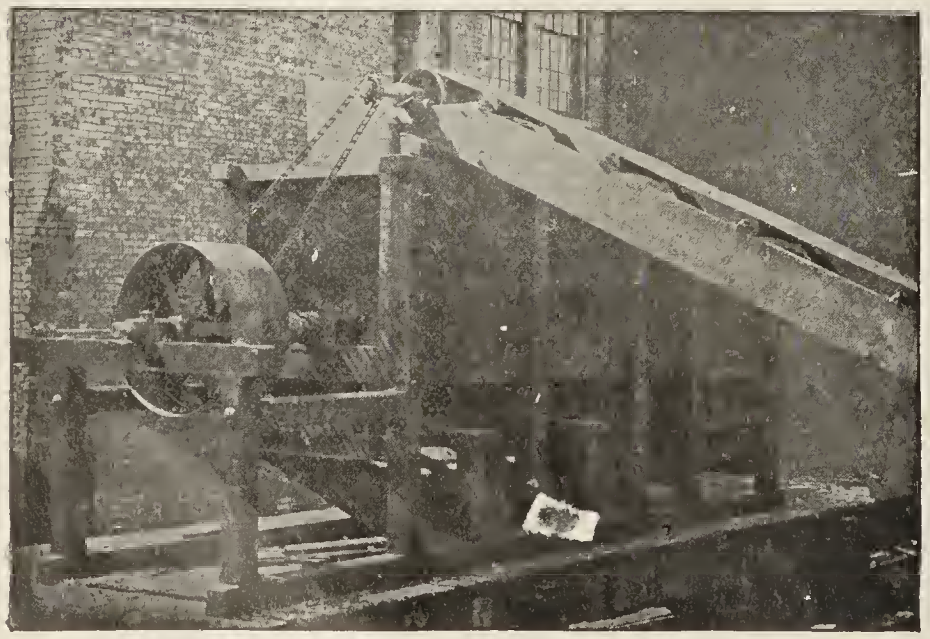
First successful attempt to burn Crude Oil in a Continuous Kiln; can be applied to any system.

Lehmann Metal Lined, Self-Lubricating Die

Can be made and adapted to any kind of clay at the place of manufacture, and insures uniformity of size of manufactured goods.



CONTINUOUS KILN



LEHMANN SLUMMING MACHINE

Lehmann Slumming Machine

MOST PRACTICAL, SIMPLE AND EFFECTIVE

The slumming process is the most economical and the only reliable method for removing gravel and other foreign matter from Common Clay, Kaolin, Chalk, Mineral Paints, etc.

ALL THESE DEVICES HAVE BEEN TRIED THOROUGHLY AND SUCCESSFULLY.

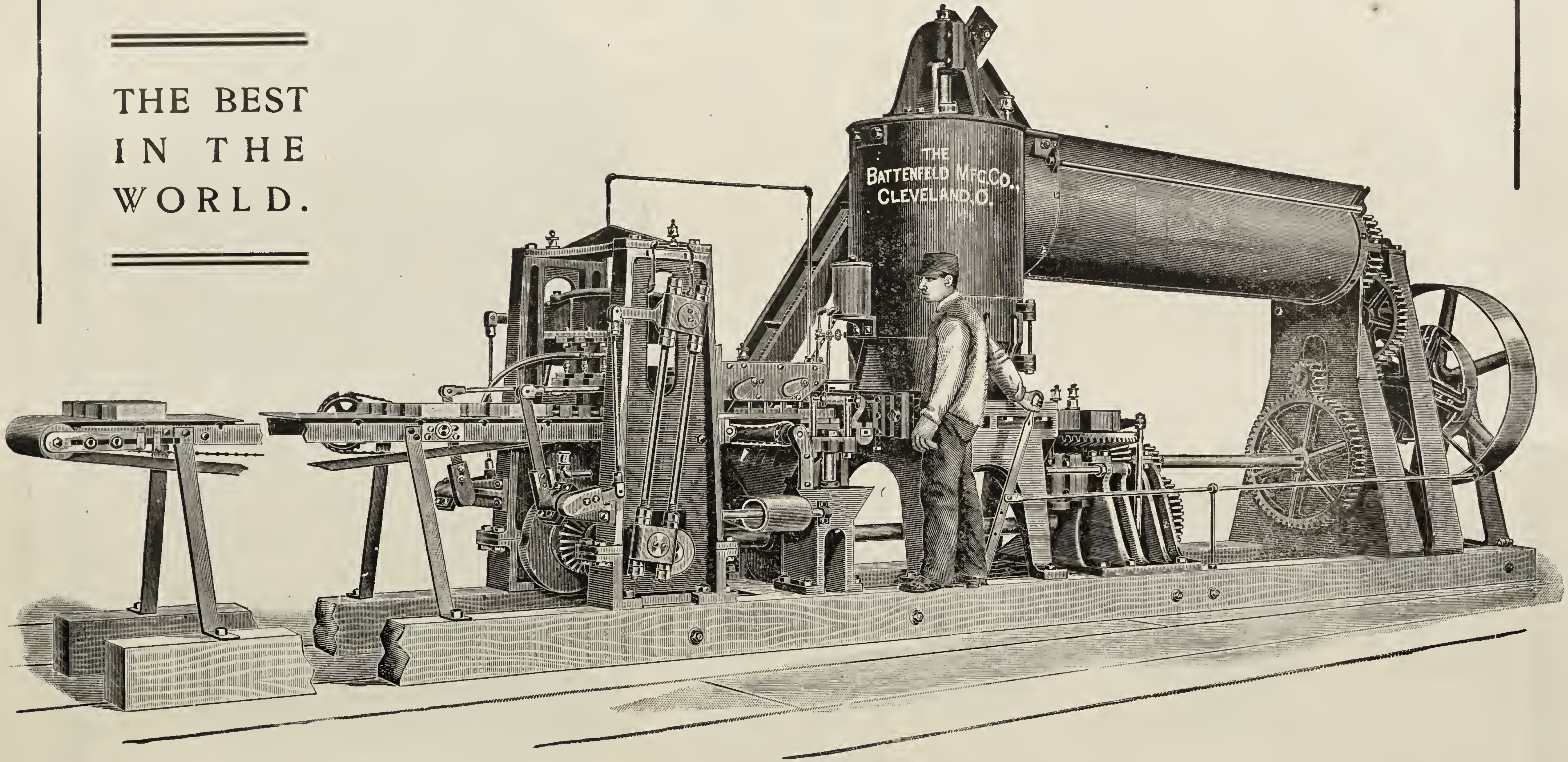
Will plan and construct any system of Kiln... Up-Draft, Down-Draft, Muffle or Tunnel. Plans and estimates furnished for Brick and Tile, Lime and Cement Work. Practical tests made.

F. LEHMANN COMPANY

Consulting Clay-Worker Engineers,
163 Rhine Street, Chicago, Ill.

THE DICTATOR BRICK MACHINE

THE BEST
IN THE
WORLD.

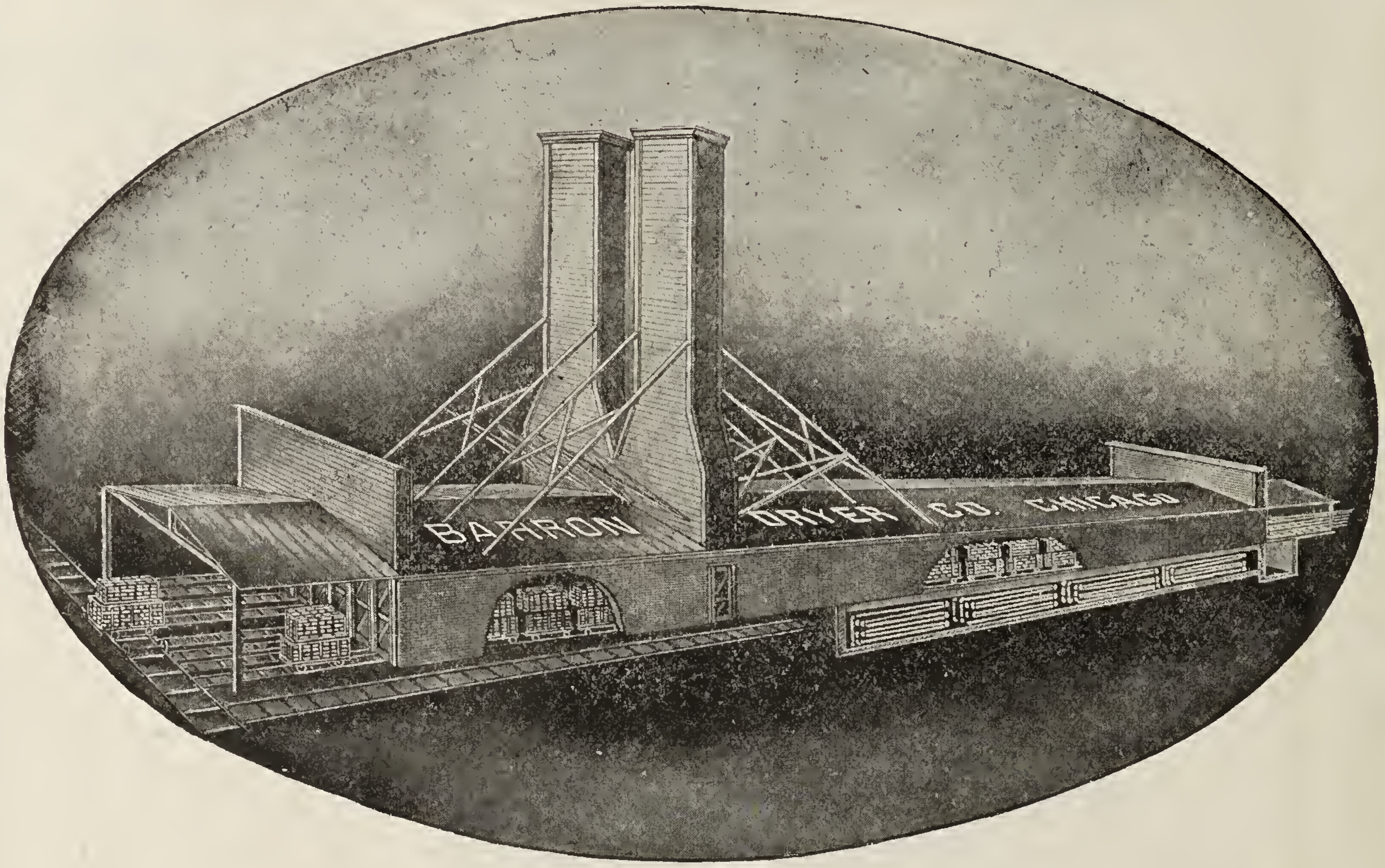


THE
BATTENFELD MFG.CO.
CLEVELAND, O.

THE BATTENFELD MFG. CO.

WRITE FOR CATALOGUE.

CLEVELAND, OHIO.



If You Are Progressive

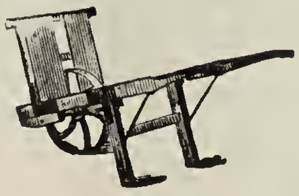
You know that the brickmakers who are making the money in these days are those who have installed an up-to-date drying system enabling them to cope with ease with the heaviest demands of the market, their operations being uninterrupted all the year round.

This is true of them, what of your case? Why adhere still to antiquated methods subjected to weather limitations. Determine to install the most effective drying system in existence and apply for information and quotations to the

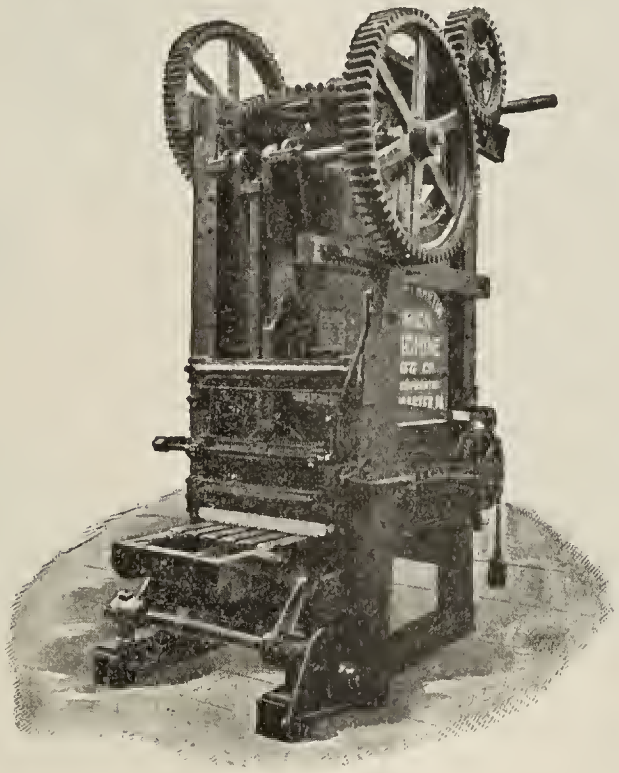
BARRON DRYER COMPANY

Temple Court Building, 225 Dearborn Street, CHICAGO, ILL.

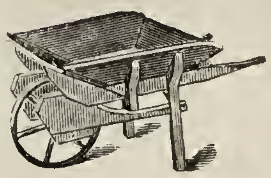
THE BEST IS THE CHEAPEST IN THE END

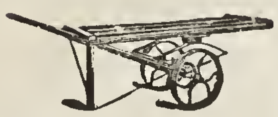


The Machine that "makes good" Brick



"Best by Test" Martin Machinery





Martin's Style "A."

Have you a copy of our 1905 catalogue? Better consult it before you buy elsewhere.

Our Engineering Department is ever at your service. Consult our experts on brick yard troubles.

SOFT MUD PLANTS

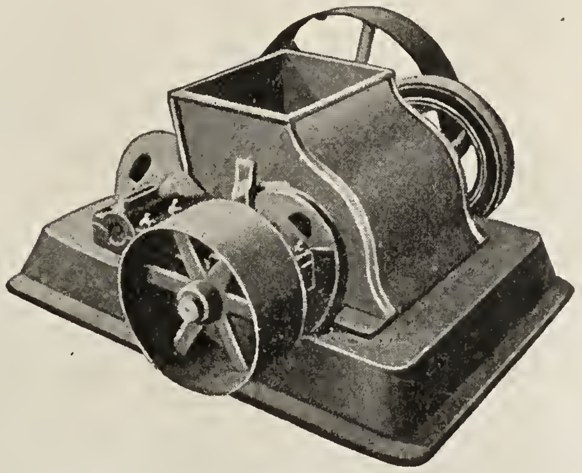
AUGER MACHINERY

ROCK CRUSHING PLANTS

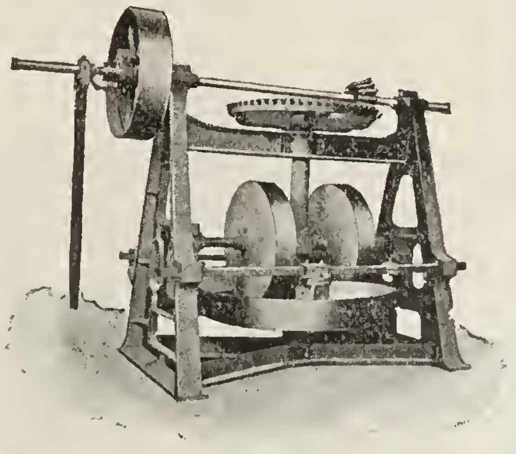
ELEVATORS AND CONVEYORS

MARTIN

IN STEAM DRYING there is no system as simple as the MARTIN, or that will give more satisfactory results, and at as low a cost for continual operation. Will **positively** dry the brick over night. No cars, fans, blowers, trucks or engines. Let us talk the matter over with you.



DISINTEGRATORS.



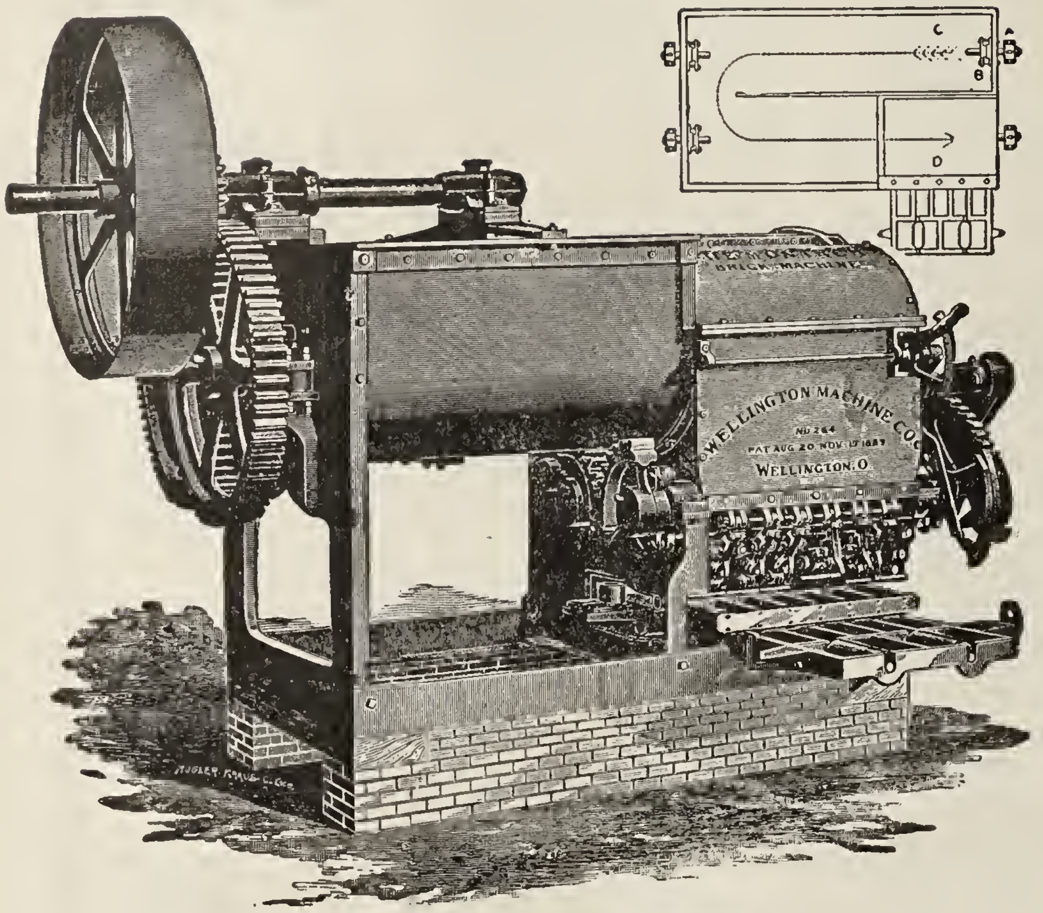
DRY AND WET PANS.

WE FURNISH EVERYTHING A BRICKMAKER NEEDS.

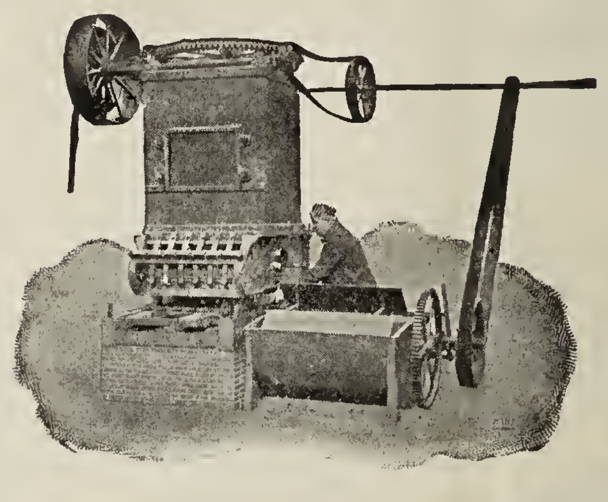
THE HENRY MARTIN BRICK MACHINE MFG. CO.

LANCASTER, PA., U. S. A.

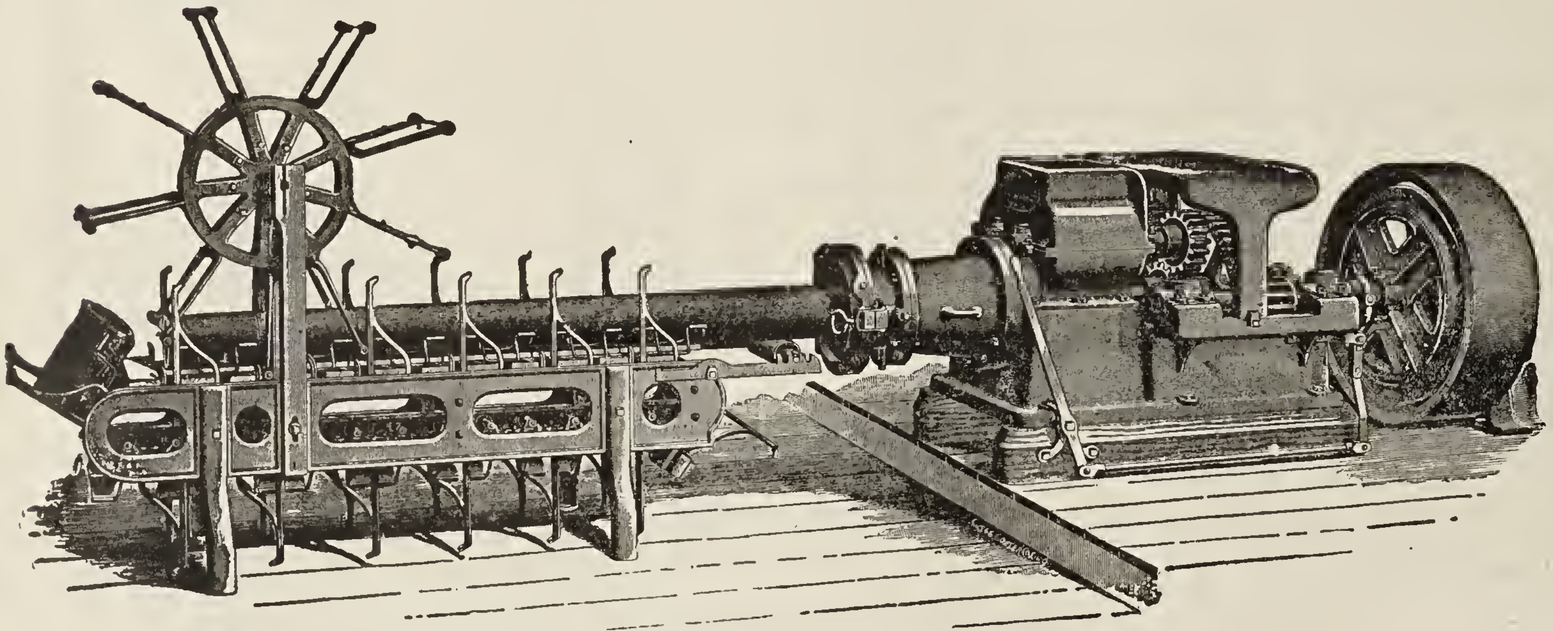
BRICK and TILE MACHINERY



MONARCH STOCK BRICK MACHINE
Capacity, from 30,000 to 50.000



THE QUAKER
Horse or Steam Power. Capacity, 20,00 to 35,000

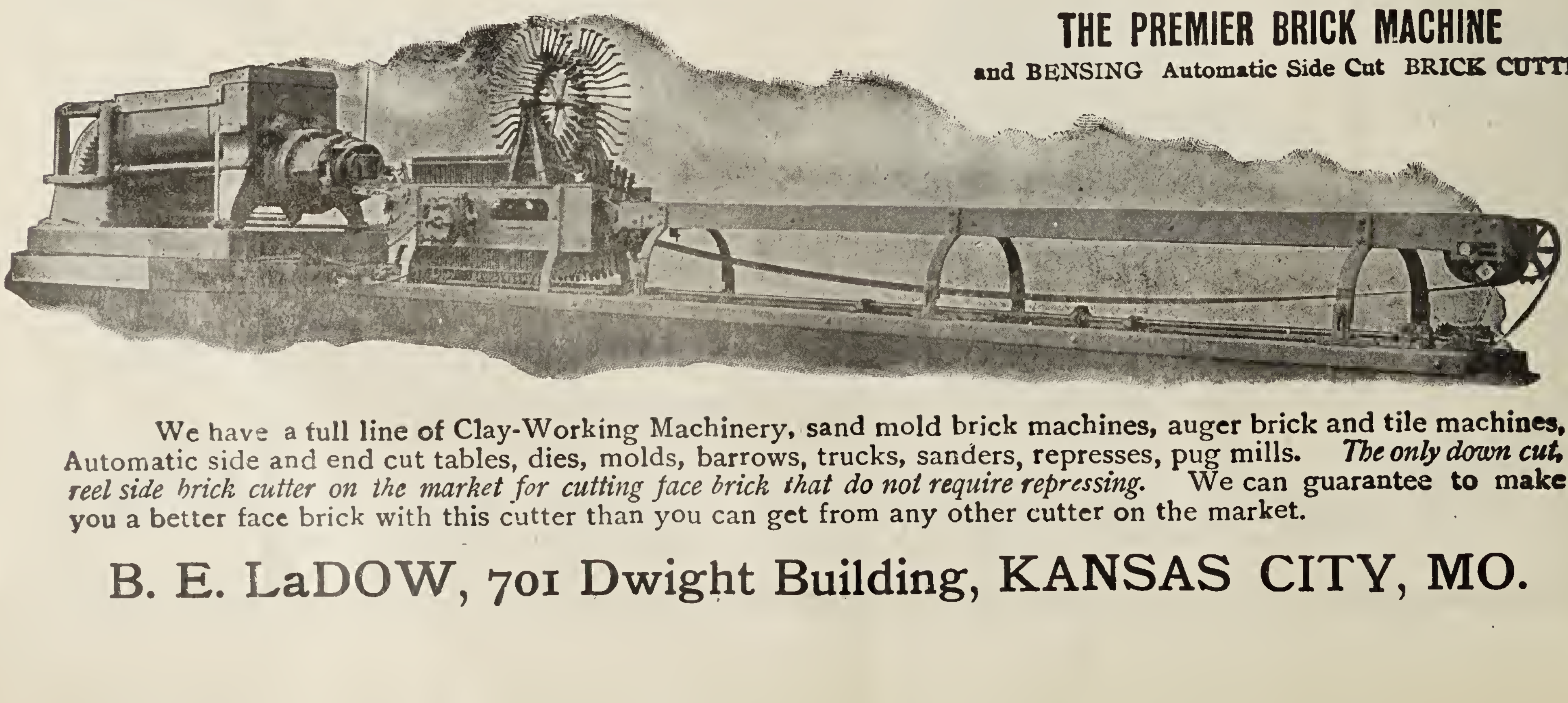


BRICK OR TILE MACHINE, WITH AUTOMATIC TABLE

"We Fulfill our Guarantees."

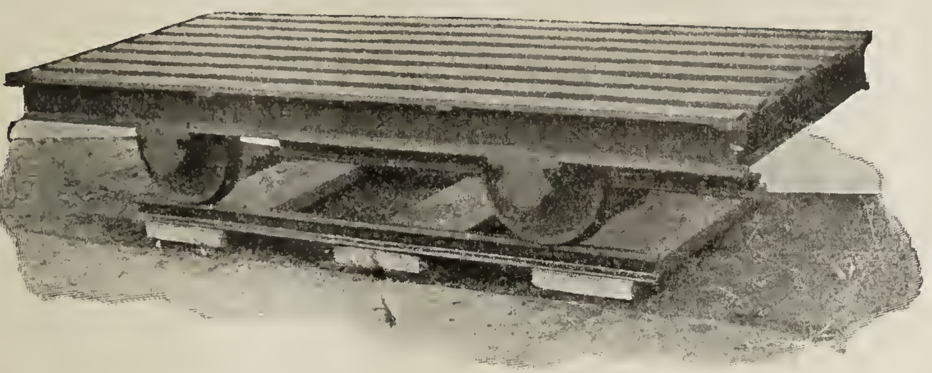
THE PREMIER BRICK MACHINE

and BENSING Automatic Side Cut BRICK CUTTER.

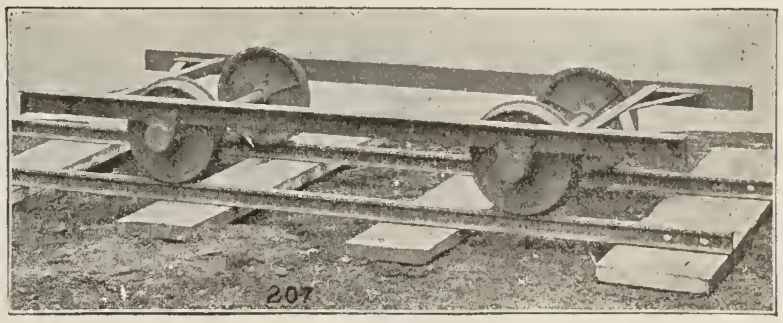


We have a full line of Clay-Working Machinery, sand mold brick machines, auger brick and tile machines, Automatic side and end cut tables, dies, molds, barrows, trucks, sanders, represses, pug mills. *The only down cut, reel side brick cutter on the market for cutting face brick that do not require repressing.* We can guarantee to make you a better face brick with this cutter than you can get from any other cutter on the market.

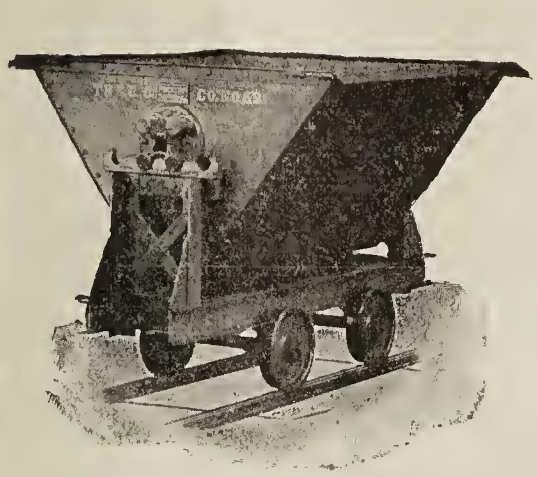
B. E. LaDOW, 701 Dwight Building, KANSAS CITY, MO.



No. 212.
STEEL DECK CAR, CHANNEL FRAME.
For Drying Brick, Sewer Pipe, Etc.



No. 207.
FLAT CAR, WOODEN DECK.
For Brick, Tile, Etc.



No. 52.
TRUNION DUMP CAR.
For Handling Coal, Sand, Ashes, Etc.

The
Cleveland Car
Company

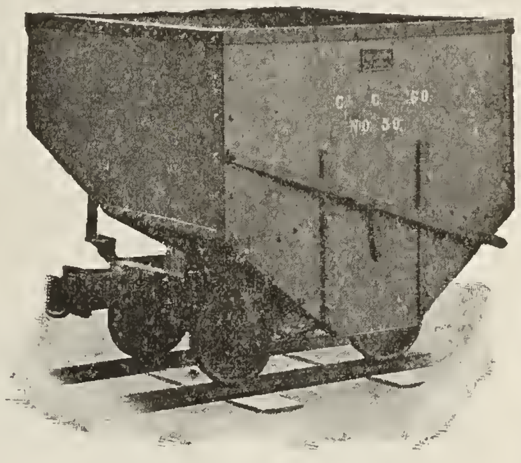
West Park -:- Ohio

Designers and Builders of

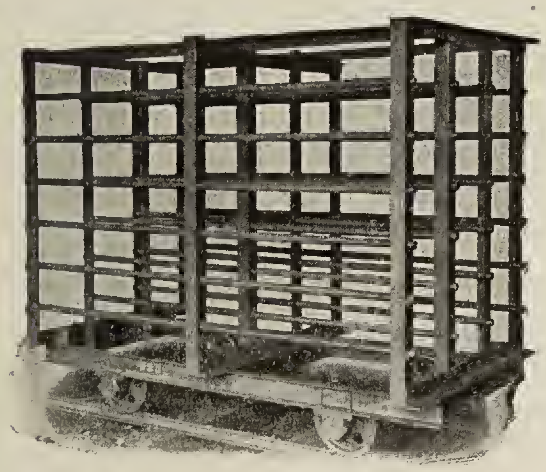
Complete Equipment for Narrow Guage Railroads

Dryer Cars of Every Description, Dump Cars, Turn Tables, Transfer Cars, Switches, Frogs, Rails, Etc.

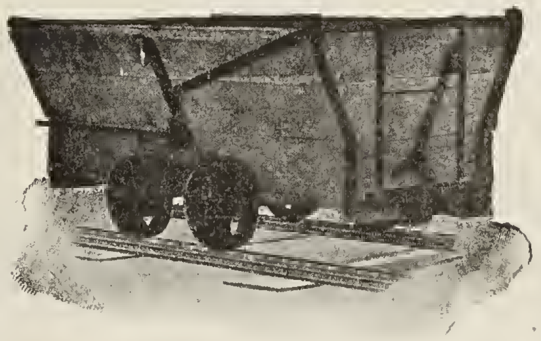
Overhead Trolleys, Kiln Doors, Furnace Fronts, Grate Bars and Brick Barrows : : : :



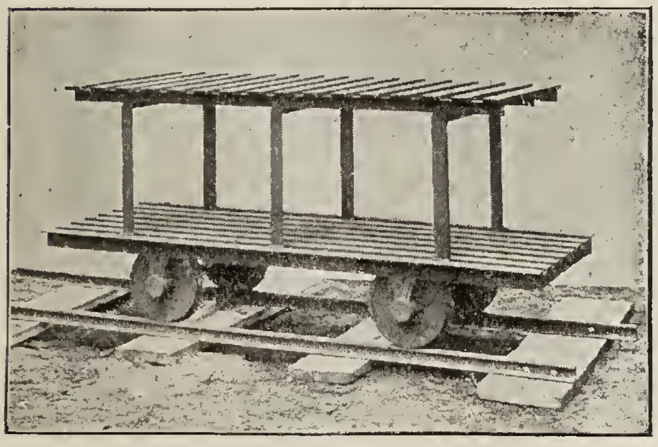
No. 50.
ONE SIDE DUMP CAR.
For Dumping Into Dry Pans, Disintegrators and Crushers.



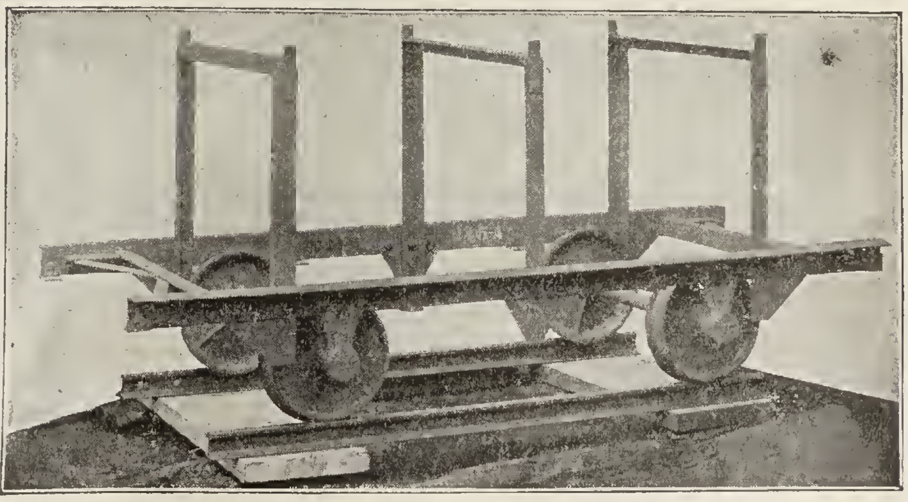
No. 523.
RACK CAR, HEAVY TYPE.
For Use With Coke Oven, Furnace and Cupola Block.



No. 31.
END DUMP CAR.
Adapted to Handling Coal, Shale, Sand, Etc.

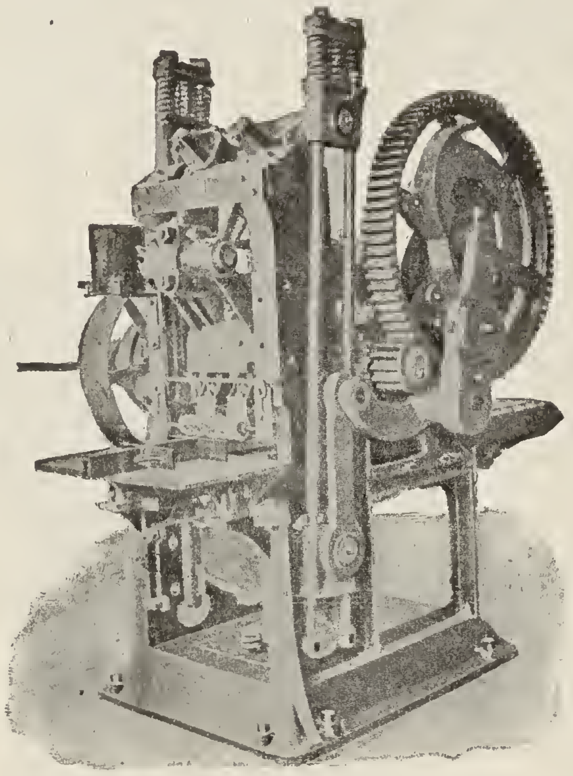


No. 214.
DOUBLE DECK CAR, STEEL DECKS.
For Brick, Tile, Fire-Proofing, Etc.



No. 245A.
DOUBLE DECK CAR, WOODEN DECK.
For Brick and Other Clay Products.

THE RICHARDSON REPRESS



Richardson Double Die Repress.

HAS NEVER BEEN REPLACED by one of another make.

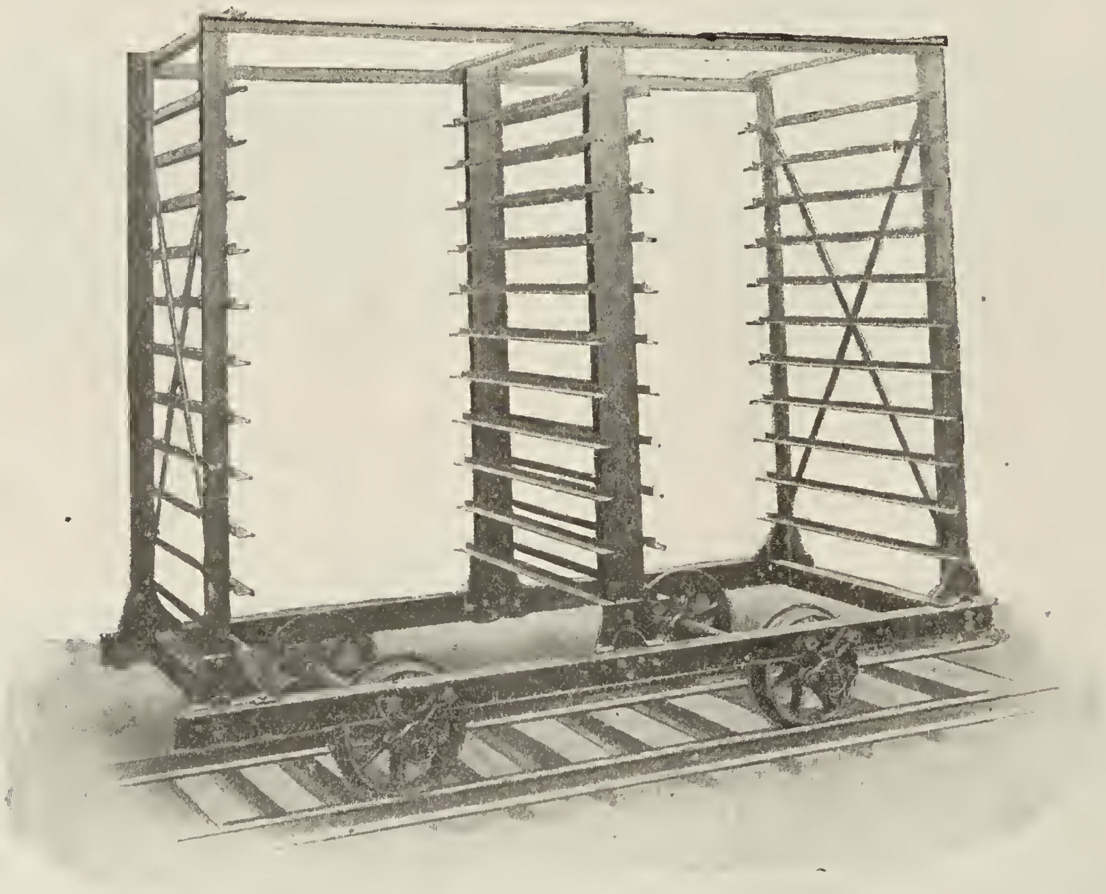
This is a fact that we think it not improper to boast of.

Do you not agree with us and is this not the repress you want in your plant?

"We also have another boast coming." We never had any of our dryer cars rejected.

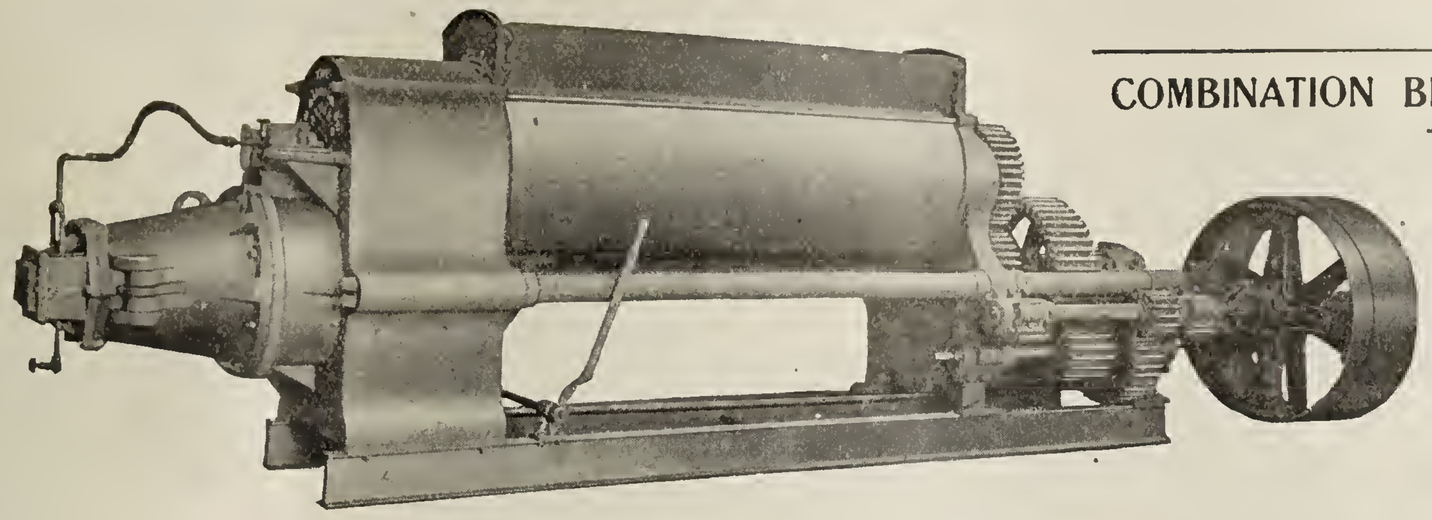
They are fit companions for our repress.

We are prepared to furnish you any machinery you want or will build your plant complete.



Soft Mud Rack Car.

The Ohio Ceramic Engineering Company
Cleveland, Ohio.



COMBINATION BRICK MACHINE

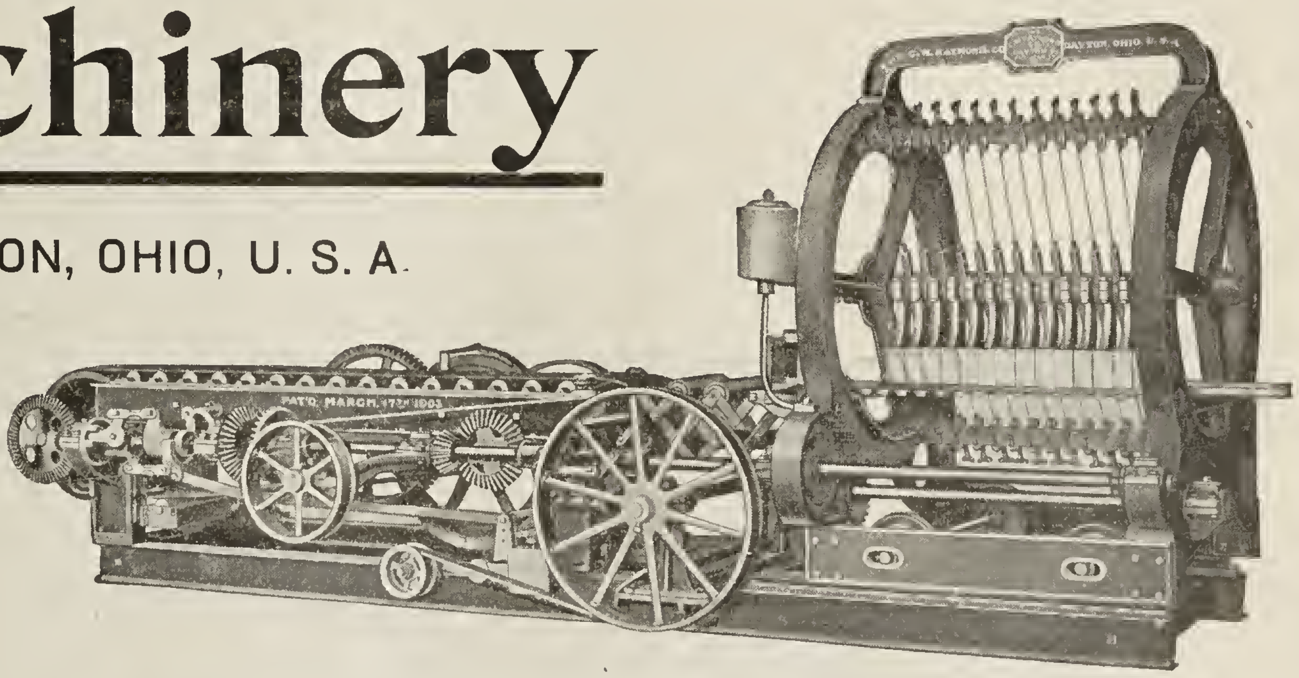
THE

C. W. RAYMOND CO.

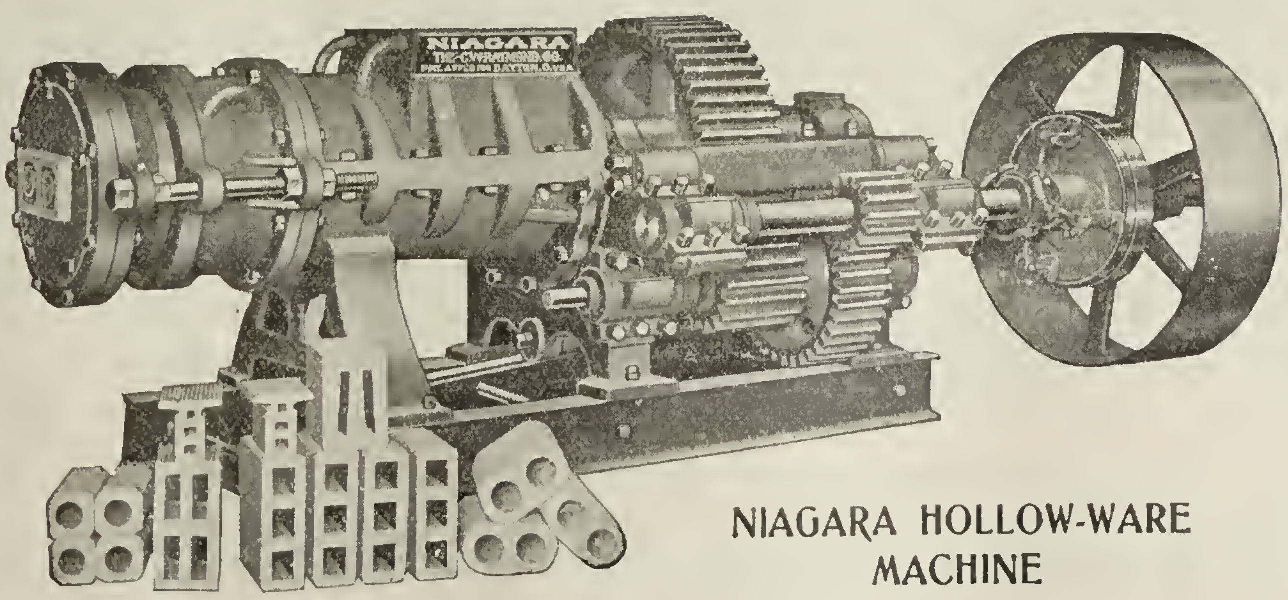
Clay-Working Machinery

DAYTON, OHIO, U. S. A.

NEW YORK
39—41 Cortlandt Street
ST. LOUIS
315 Frisco Building
PITTSBURG
1425 Park Building



AUTOMATIC DOWN-CUT CUTTER

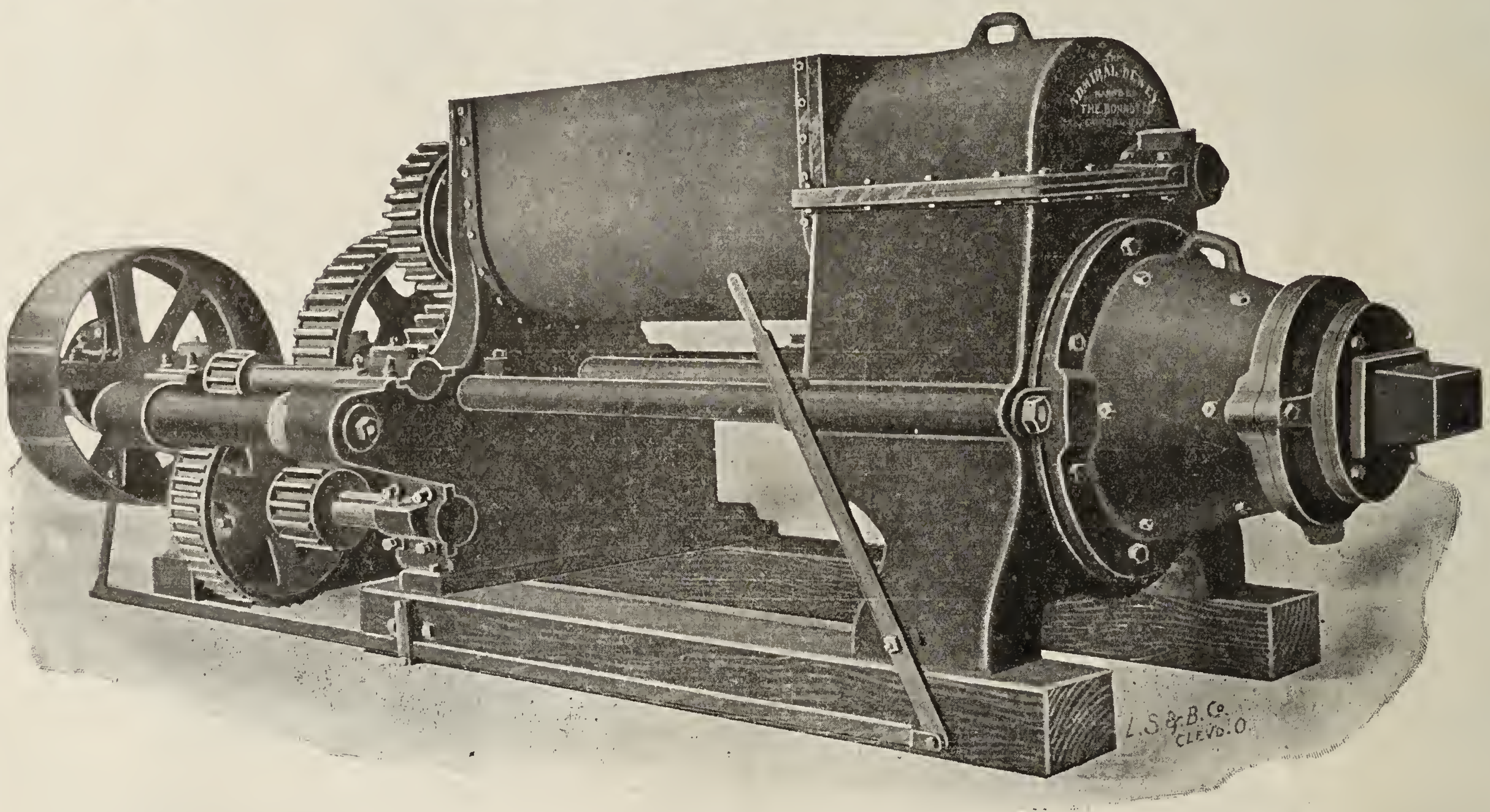


NIAGARA HOLLOW-WARE MACHINE

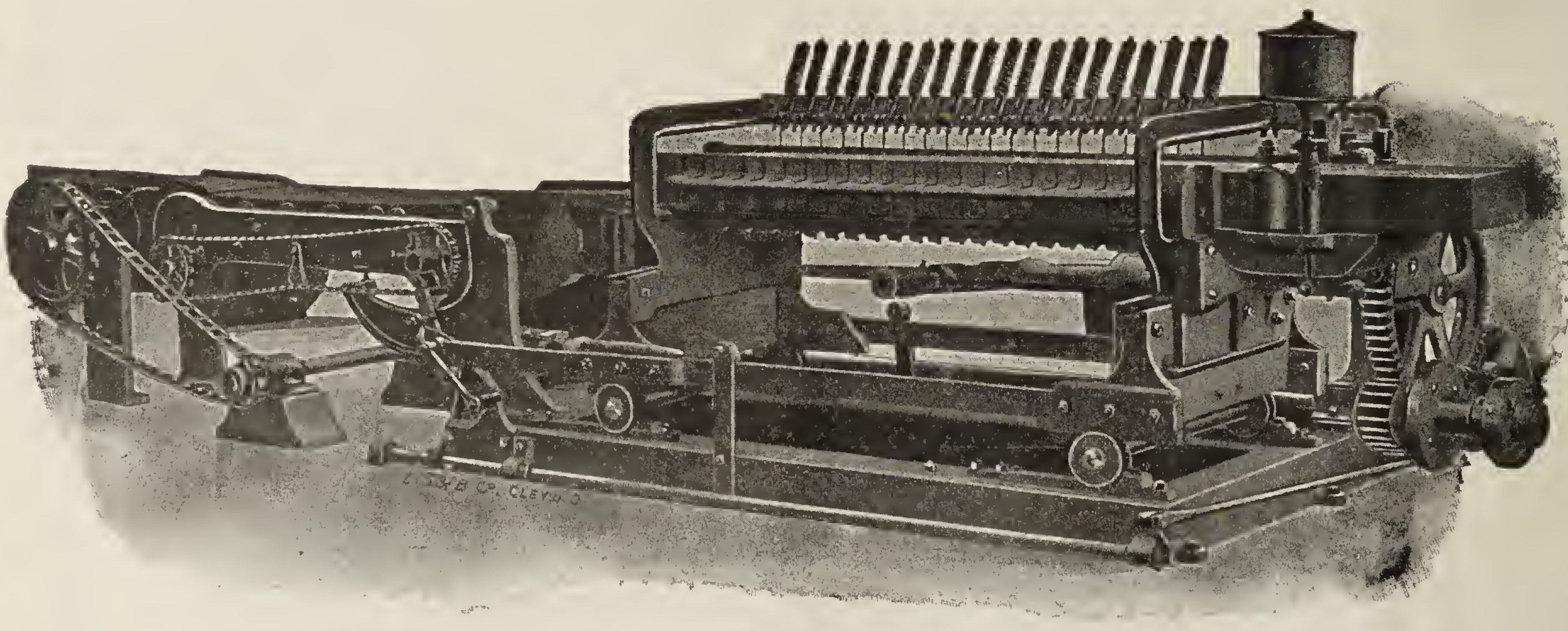
Raymond Machinery
Creates New
Business for the User
Better Brick
and more of them.

CATALOGUE

Modern Brick Machinery


L.S.&B.Co. CLEV'D.O.

SPECIAL COMBINED BRICK MACHINE AND PUG MILL 100 000 daily capacity.
AUGER BRICK MACHINES 10,000 to 100 000 capacity five sizes.



AUTOMATIC SIDE CUT TABLE. Simple, positive, durable.

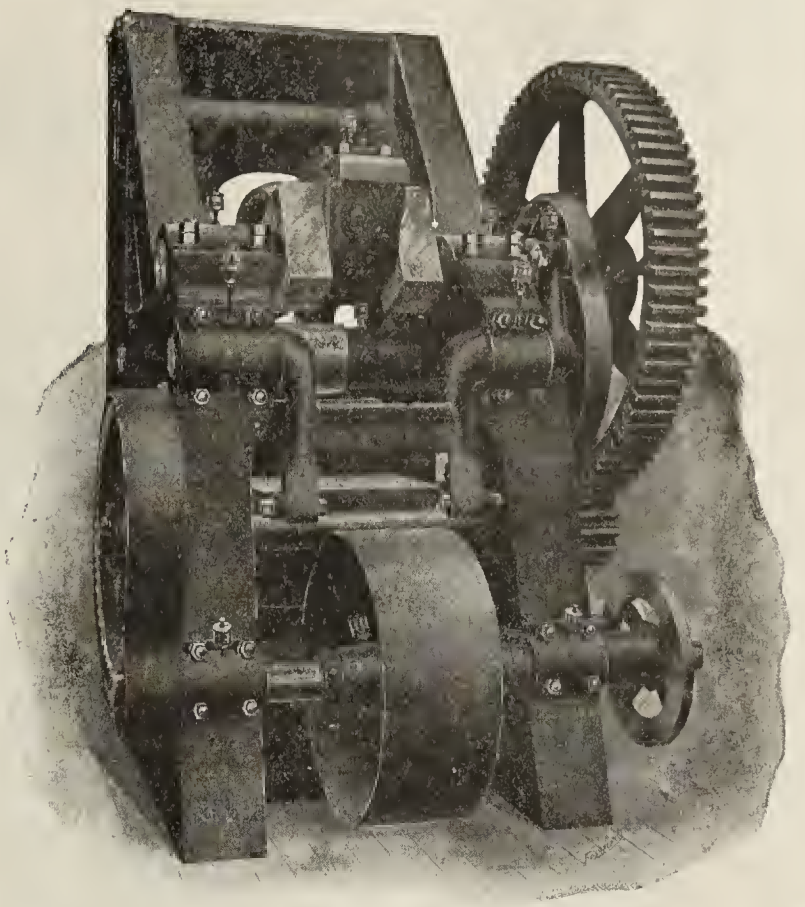
COMPLETE EQUIPMENTS FOR BRICKMAKERS. *ASK FOR CATALOGUE.*

THE BONNOT COMPANY, Canton, Ohio.

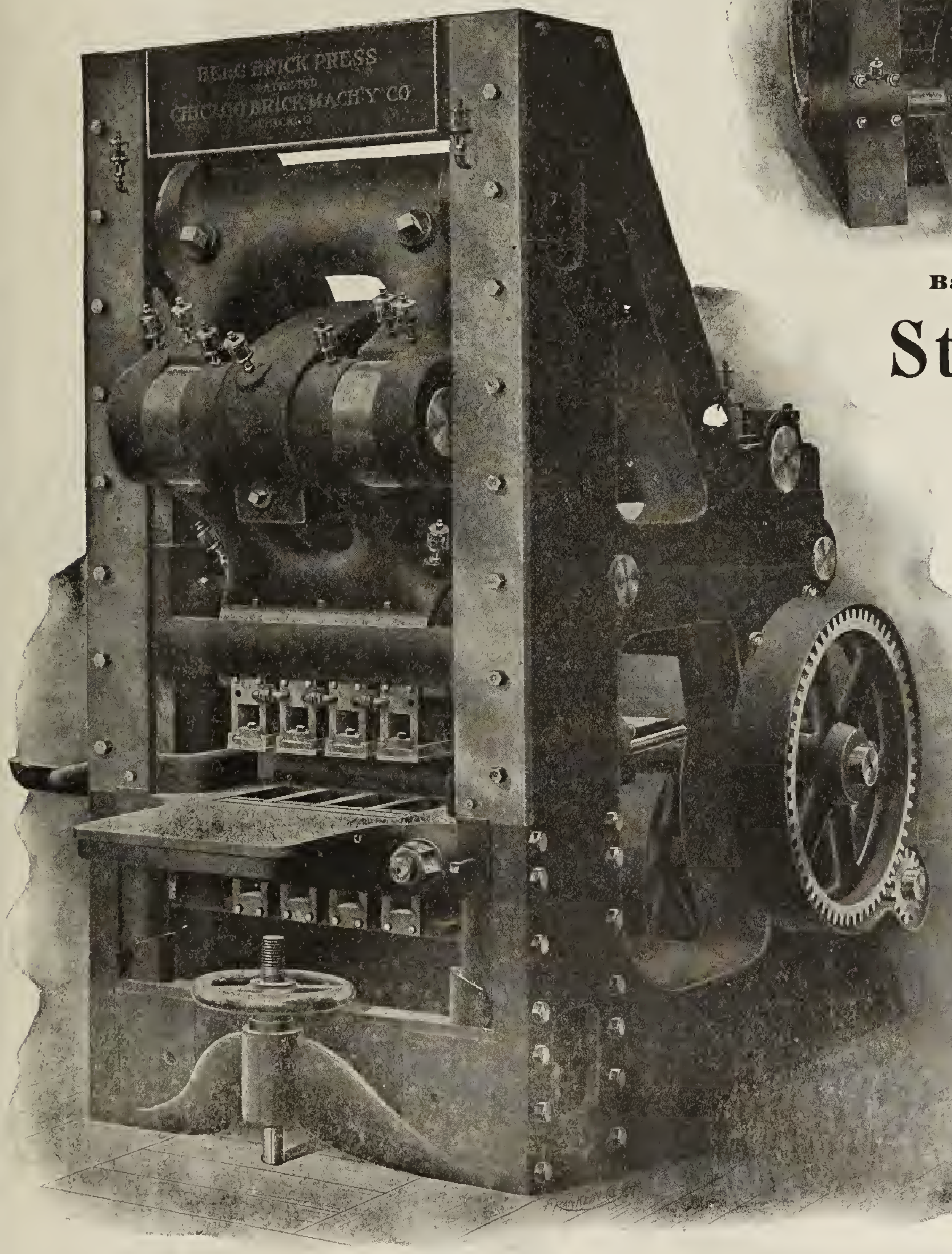
—WESTERN AGENTS—

CHICAGO BRICK MACHINERY CO., - - 77 Jackson Boulevard, Chicago, Ill.

1904 MODEL BERG BRICK PRESS



Back View.



Still in the Lead

AND

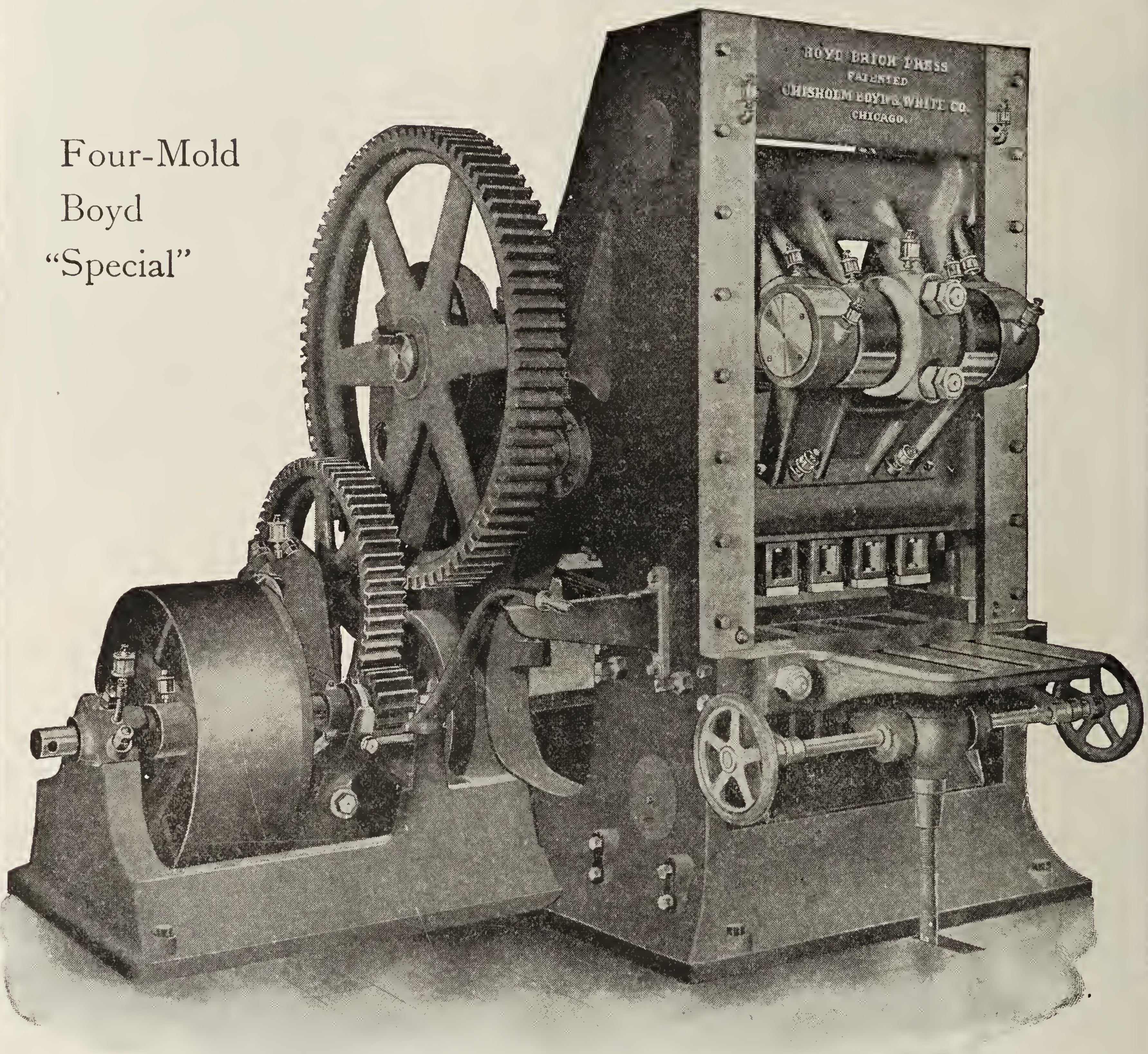
One Step Further Forward

Even stronger than ever and all self-contained. Greater pressure and fewer working parts than any other machine. Simple, massive, compact. Running mechanism placed in rear, as shown in upper cut, enabling this machine to be SHIPPED IN ONE PIECE.

CHICAGO BRICK MACHINERY COMPANY,
Great Northern Building, 77 Jackson Boulevard, Chicago.

The Boyd Brick Press

Four-Mold
Boyd
"Special"



A Business Proposition.

We will send to any responsible party a **BOYD BRICK PRESS ON TRIAL** and subject to purchase after the making and burning of one or more kilns of brick. We take the machine back if not satisfactory.

THE BOYD BRICK PRESS exerts greater pressure, holds it longer, puts more clay into brick, and makes stronger brick than any other Brick Press made. Especially adapted for working shales, and is the only successful machine for making fire brick.

ALL BOYD PRESSES are fitted with our IMPROVED PATENTED MOLD BOX, the liners of which are made of the hardest and toughest known metal, which can be reground at low cost when worn. The molds can be changed in a few minutes.

ITS RECORD: More Boyd Presses in actual operation than of all other Press Brick Machines combined. Write for General Catalogue No. 10.

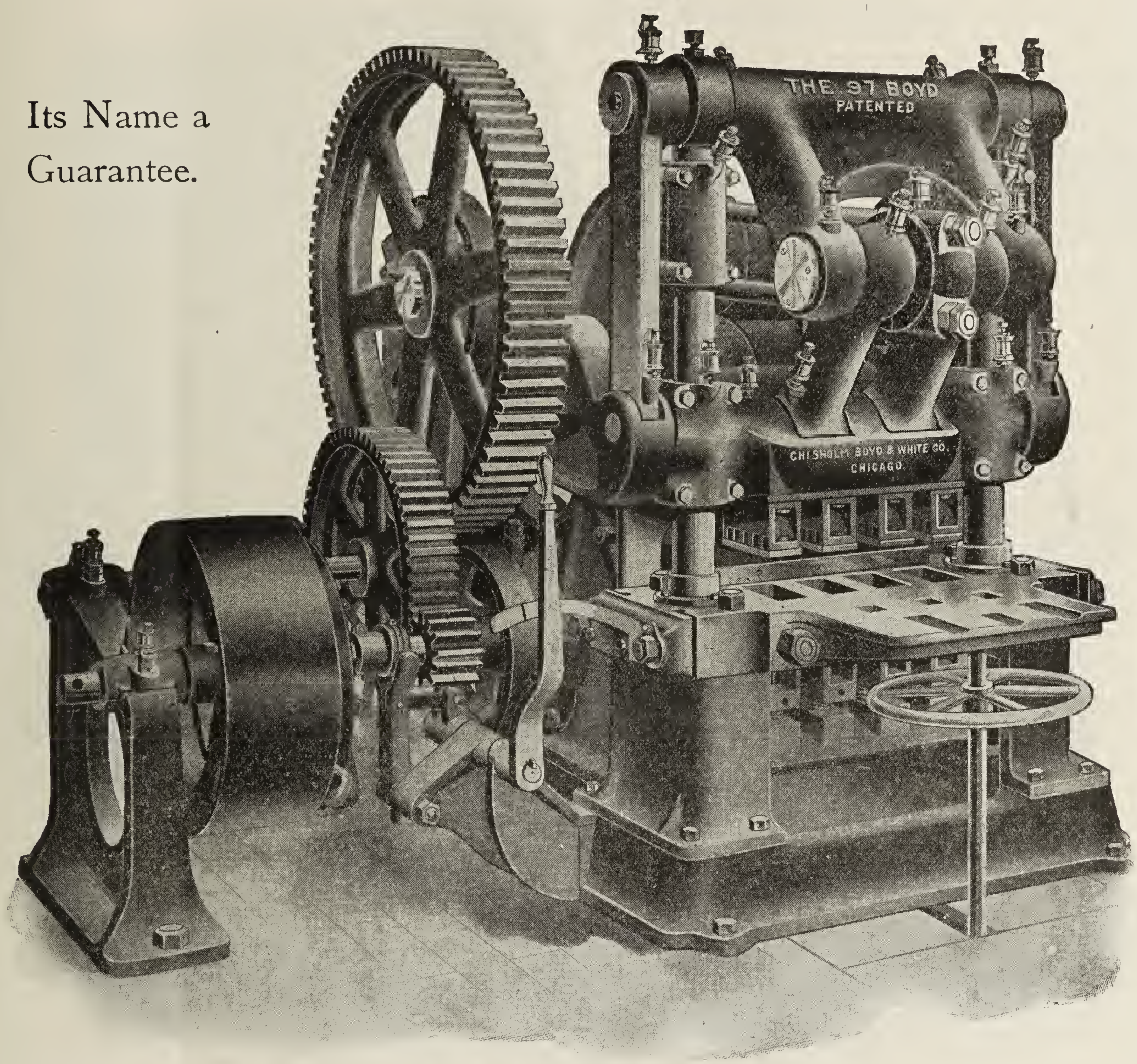
Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

The Boyd Brick Press

The '97 Model

Its Name a
Guarantee.



THE '97 MODEL BOYD BRICK PRESS has enormous strength and great durability; it is compact; the adjustments are convenient; it operates quietly and smoothly; the workmanship and material are of the best; the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking.

THE BOYD is the only Brick Press provided with an independent adjusting device for regulating the amount of clay in the molds and the pressure on the brick. This feature positively ensures equal pressure and finish on both sides of the brick, and no granulated or soft centers.

Sent on trial and fully guaranteed. Seventy presses of this pattern now in use. Cannot be broken in pressing brick. Write for descriptive catalogue No. 9.

Chisholm, Boyd & White Company

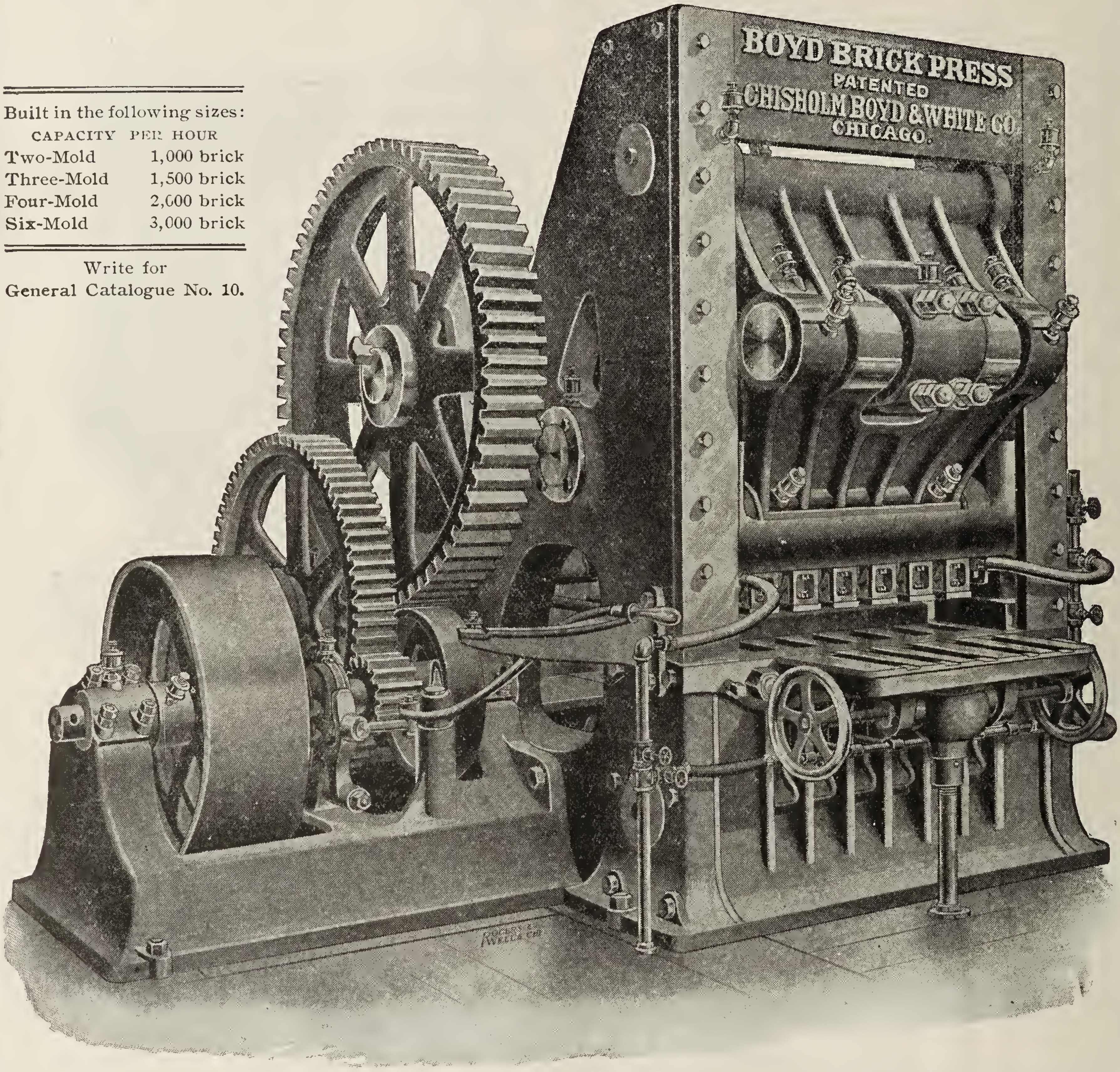
Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

The Boyd Brick Press

Built in the following sizes:

	CAPACITY PER HOUR
Two-Mold	1,000 brick
Three-Mold	1,500 brick
Four-Mold	2,000 brick
Six-Mold	3,000 brick

Write for
General Catalogue No. 10.



Another Record for the Boyd Press:

Six of our SIX-MOLD PRESSES in use on ONE YARD since 1892. Average cost of repairs for each machine One Dollar per year.

THE BOYD PRESS has always been distinguished for originality in design and construction. It will make better brick from clay or shale than can be made from the same material by any other press. It is selected and purchased by the most progressive Brick Makers. The largest and most successful brick plants in the country are using Boyd Presses.

Chisholm, Boyd & White Company

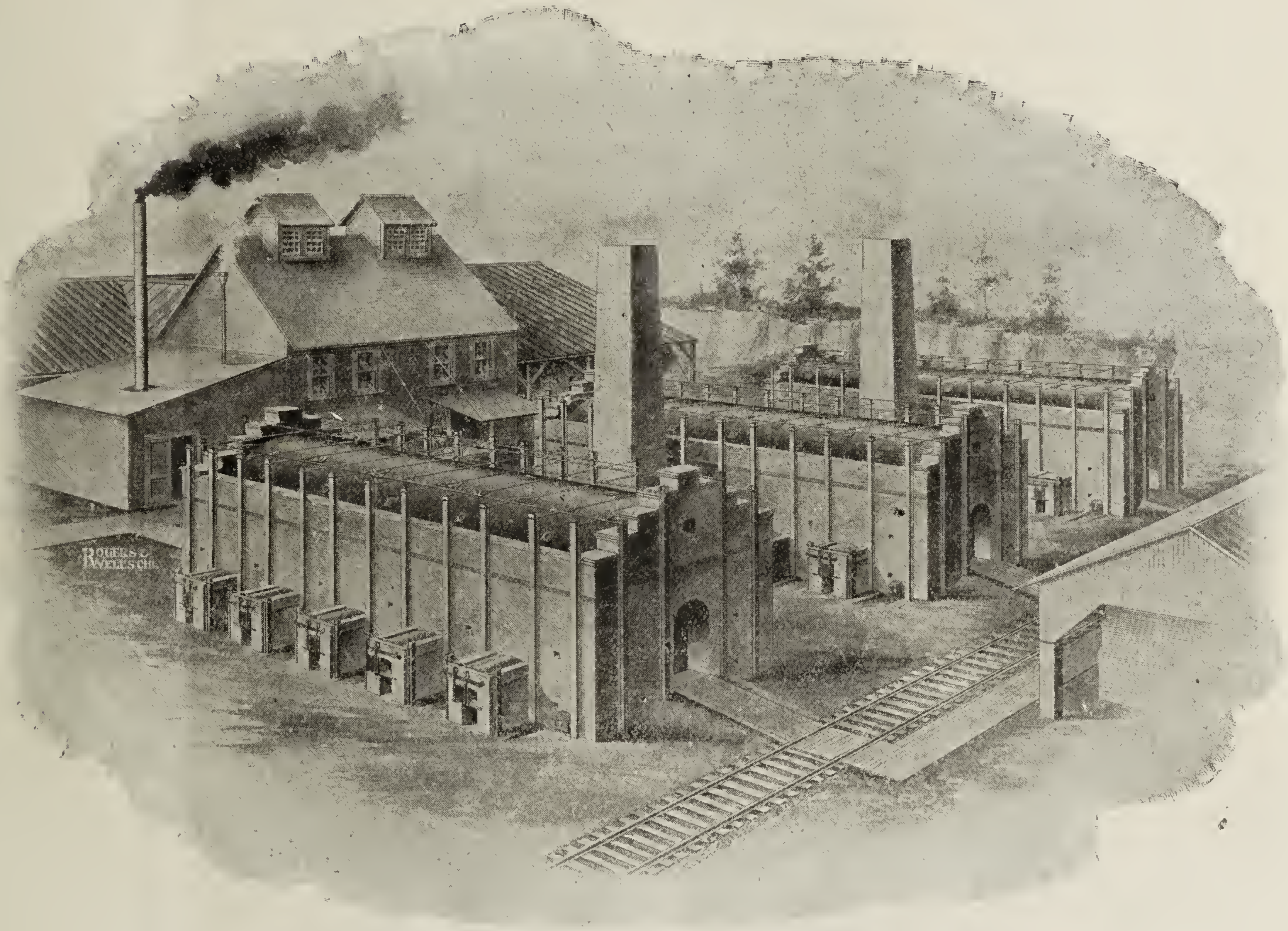
Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

Chisholm, Boyd & White Company

Engineers and Contractors for Brick Plants.

MANUFACTURERS OF

The Boyd Brick Press



A MODERN BRICK PLANT—As Equipped by us.

A Sure Thing—We design, construct and equip Brick Plants of any desired capacity, furnishing the brickmaking machinery and power plant, erect the necessary buildings and kilns, and turn the plant over to the purchaser in proper working order, under guarantee of satisfactory results.

Brick Plants designed and equipped by us have the highest reputation for efficiency. They are modern, up-to-date, compact, convenient in arrangement, and are not encumbered with unnecessary or useless machinery or appliances.

CORRESPONDENCE SOLICITED.

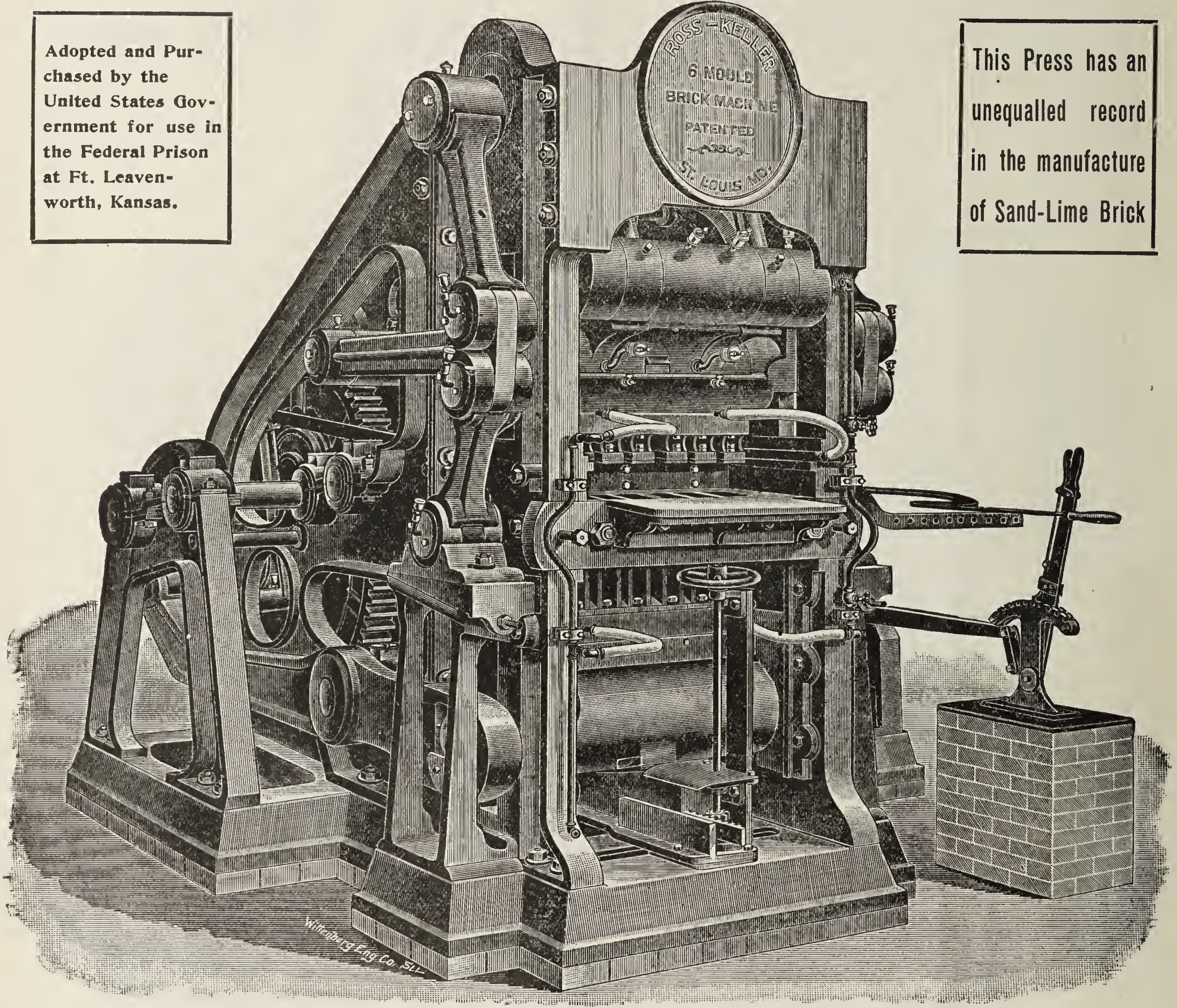
Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

BRICKMAKERS! We wish you a **HAPPY NEW YEAR!** Would you increase your profits? Then let us tell you how to improve your Brick! Let us tell you about the Ross-Keller Press! The Press that leads all others!!

Adopted and Purchased by the United States Government for use in the Federal Prison at Ft. Leavenworth, Kansas.

This Press has an unequalled record in the manufacture of Sand-Lime Brick



ROSS-KELLER TRIPLE PRESSURE BRICK MACHINE.

BUILT IN TWO SIZES.

4 mould press has daily capacity of 20,000 to 24,000 brick.
6 mould press has daily capacity of 30,000 to 36,000 brick.

Ross-Keller Triple Pressure Brick Machine Co.

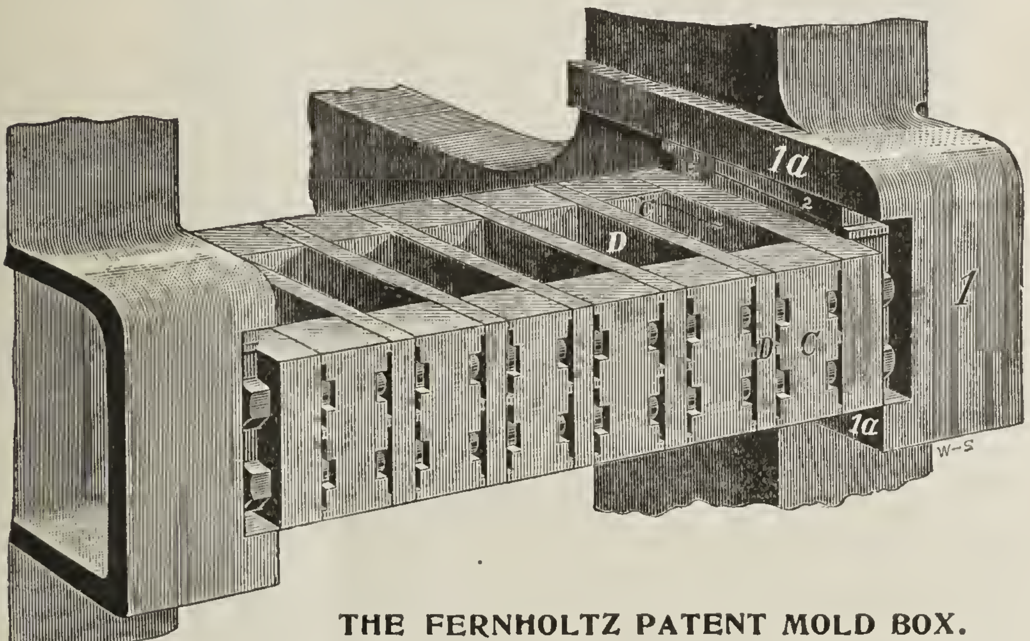
Fullerton Building, ST. LOUIS, MO., U. S. A.

The Fernholtz Brick Machinery Co.

Manufacturers of

The Celebrated Fernholtz Dry Press

Four mold Press 20,000 daily capacity. Six mold Press 30,000 daily capacity



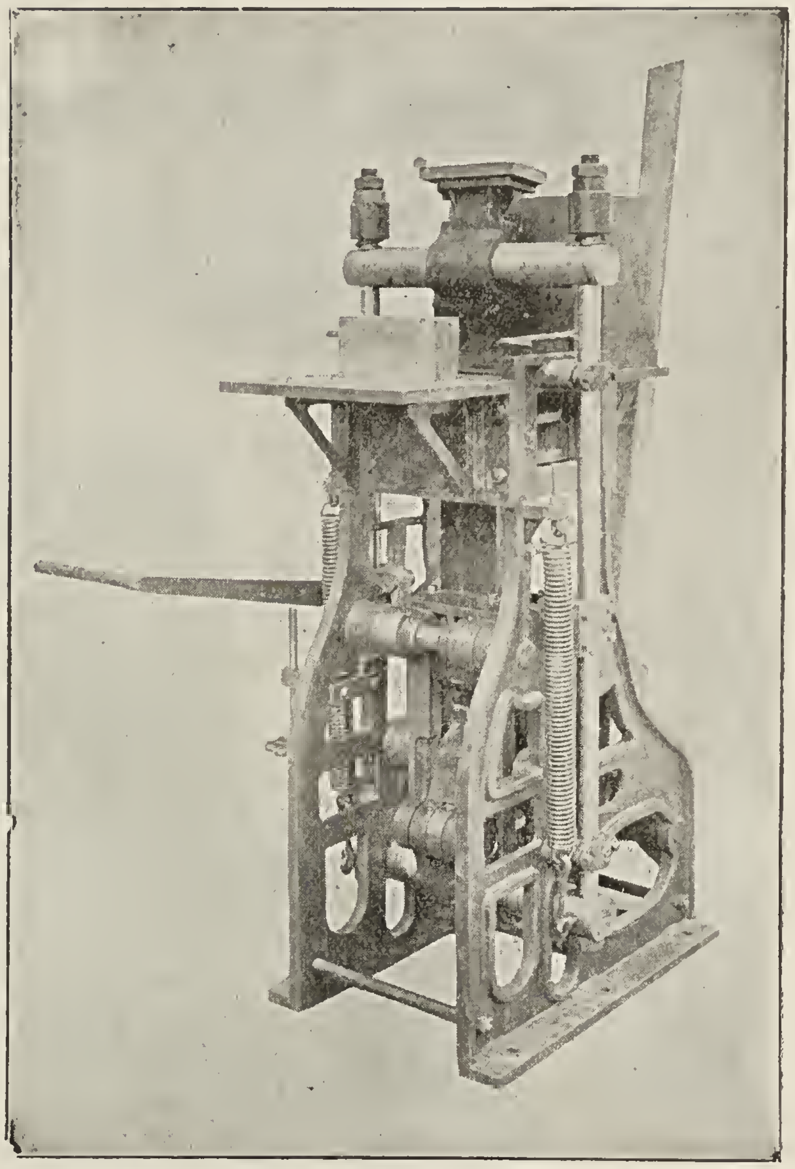
THE FERNHOLTZ PATENT MOLD BOX.

No old style Liners. The Blocks are adjustable and molds are always one size. We have put them in most all makes of Dry Press machines. Easily and quickly adjusted. They are made entirely out of chilled iron, the hardest known metal.

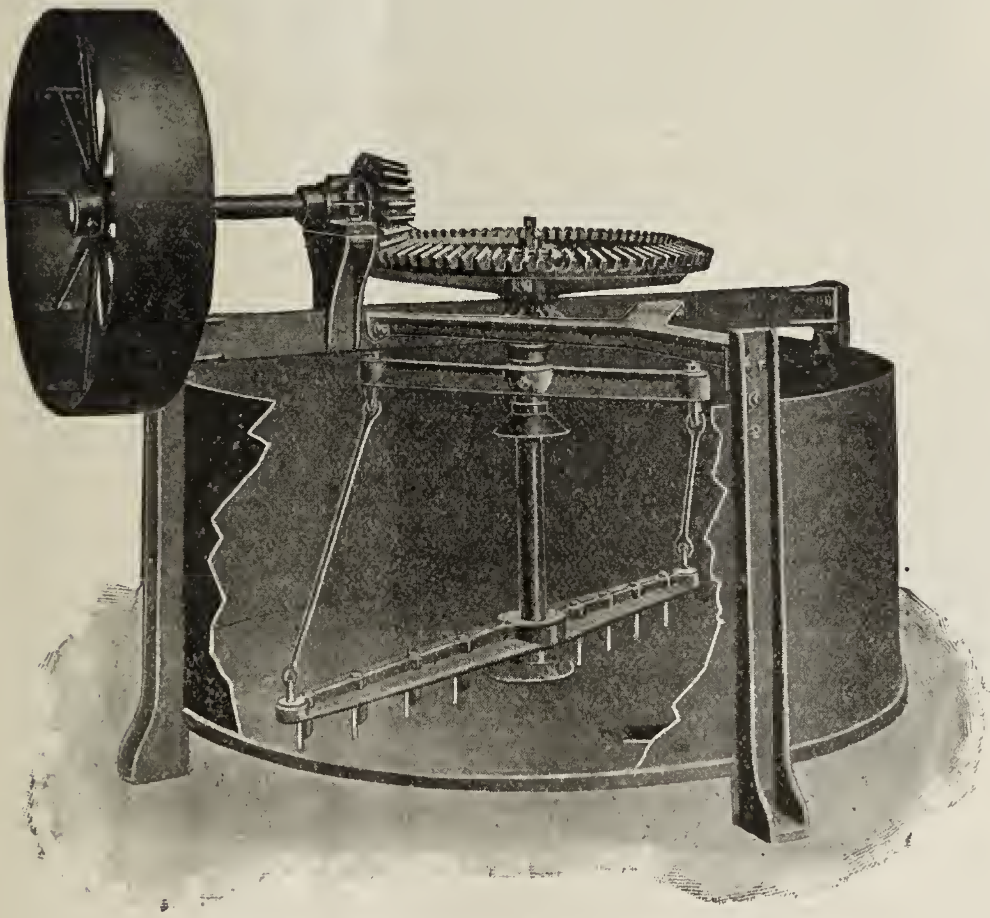
GRATH PATENT HAND POWER PRESS.

Especially adapted for ornamental designs. Any size brick up to 12⅝ inches long, 10 inches wide and 4¼ inches thick.

Brick set into kiln direct from press.



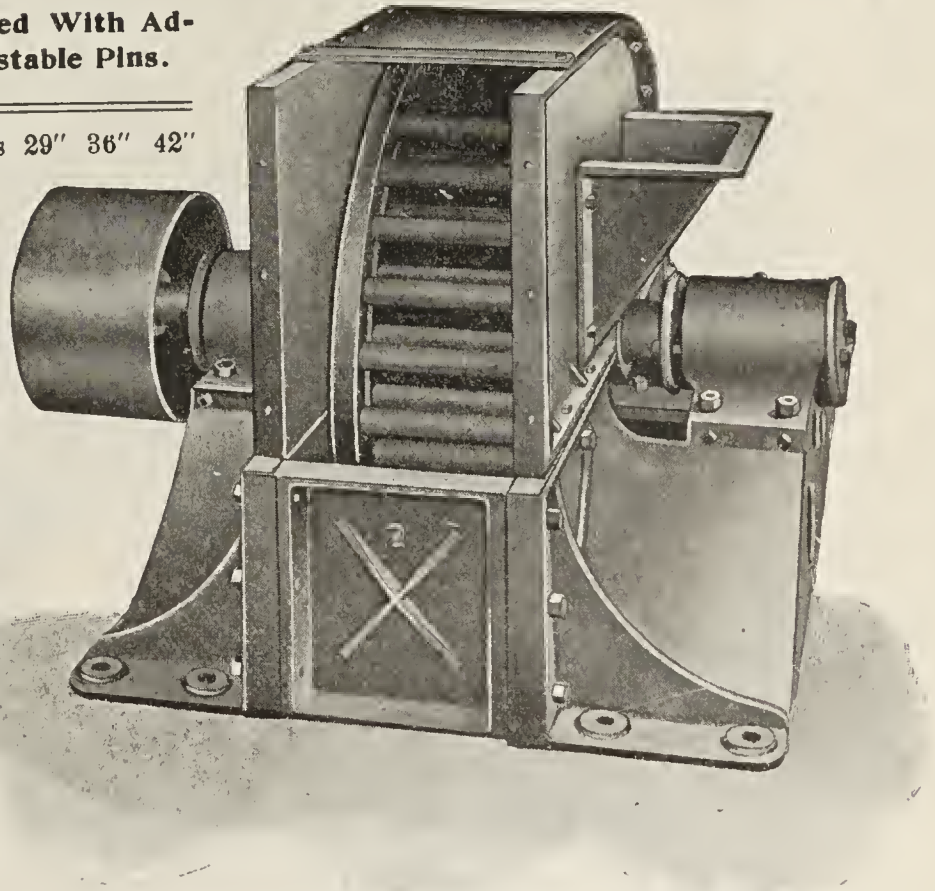
GRATH PATENT HAND POWER PRESS.



A GOOD MIXER IS ALWAYS APPRECIATED.

Fitted With Adjustable Pins.

Sizes 29″ 36″ 42″



THE FERNHOLTZ CLAY PULVERIZER.

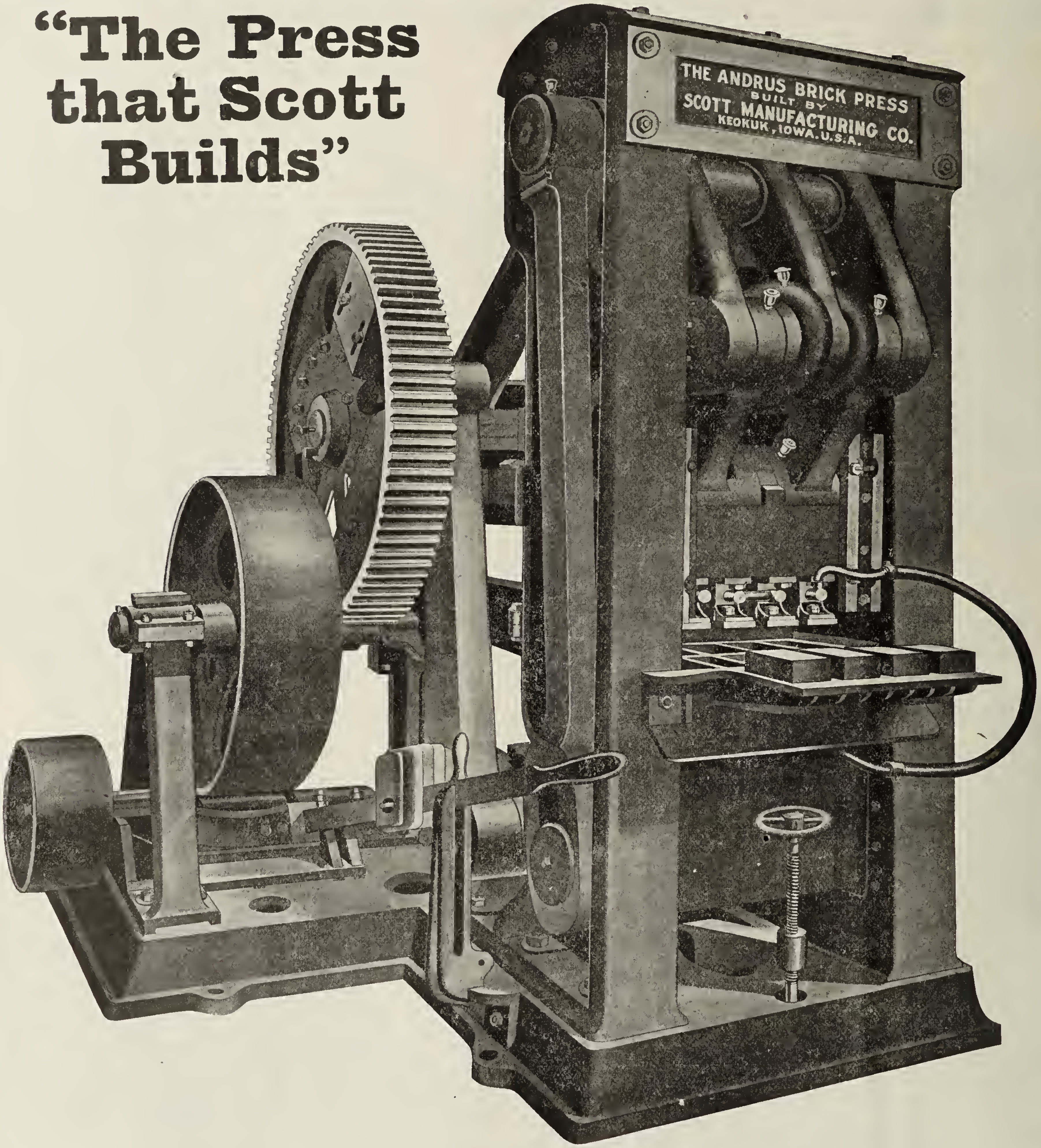
The Fernholtz Brick Machinery Co.

Cable Address "Fernbrick." Western Union Code.

Boyle Avenue and Old Manchester Road, ST. LOUIS, MO., U. S. A.

One Glance Ought to Convince You

"The Press that Scott Builds"



"Makes Brick every day" because it never takes time to lay up for repairs.

SCOTT MANUFACTURING COMPANY

Works: Keokuk, Iowa. *ST. LOUIS, MO.*

Call and see us in our new office, 609-610 Commonwealth Trust Building.

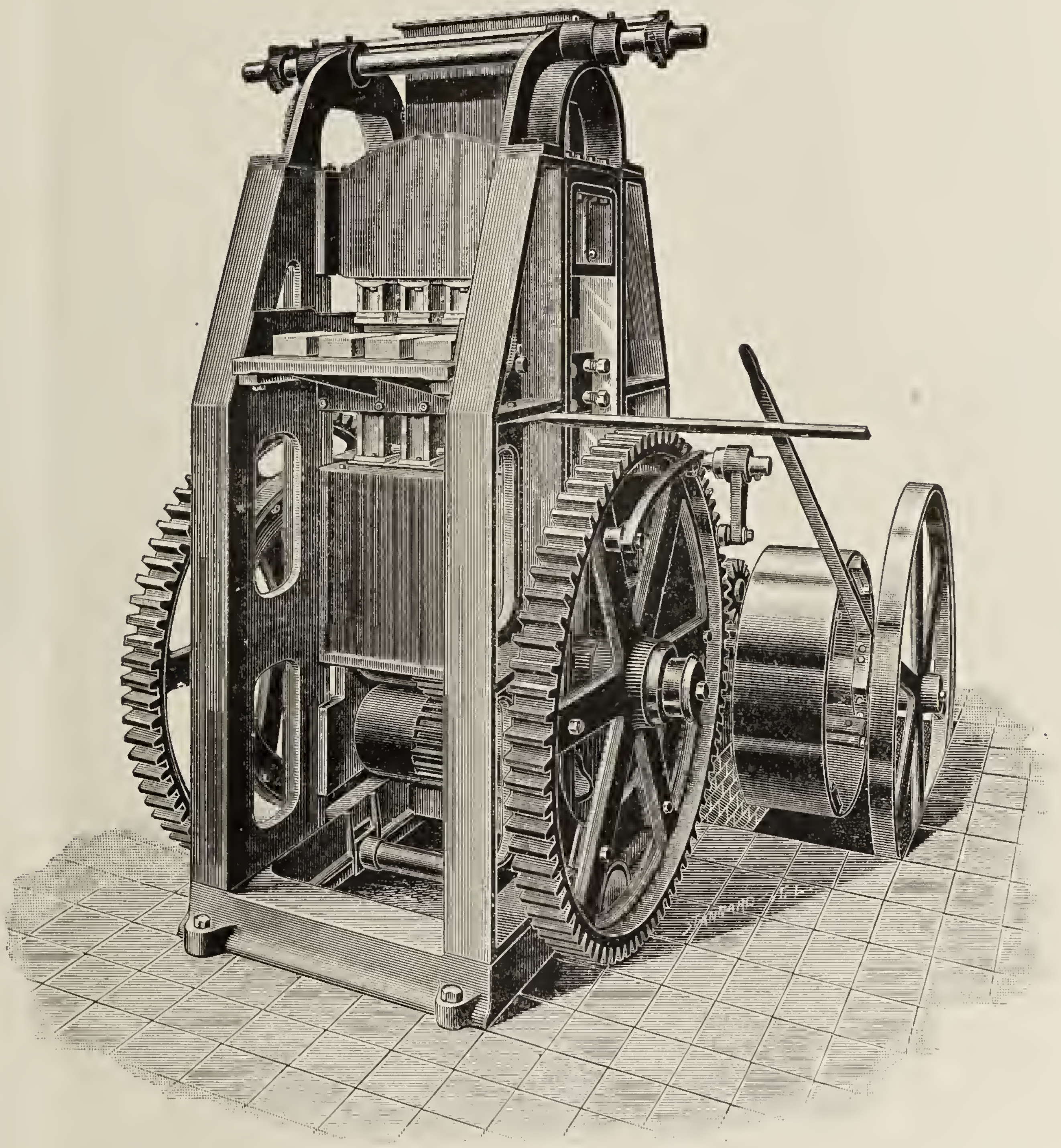
PERFECTION REALIZED

IN THE

RELIANCE DRY PRESS BRICK MACHINE

(PATENTED)

Main
Features:
Strength
Durability
Simplicity
Saves Fuel
and
Costs Less



No
Toggles
No
Links
No
Pins
to
Wear

COMPLETE DRY PRESS BRICK YARD OUTFITS

MANUFACTURED AND FURNISHED

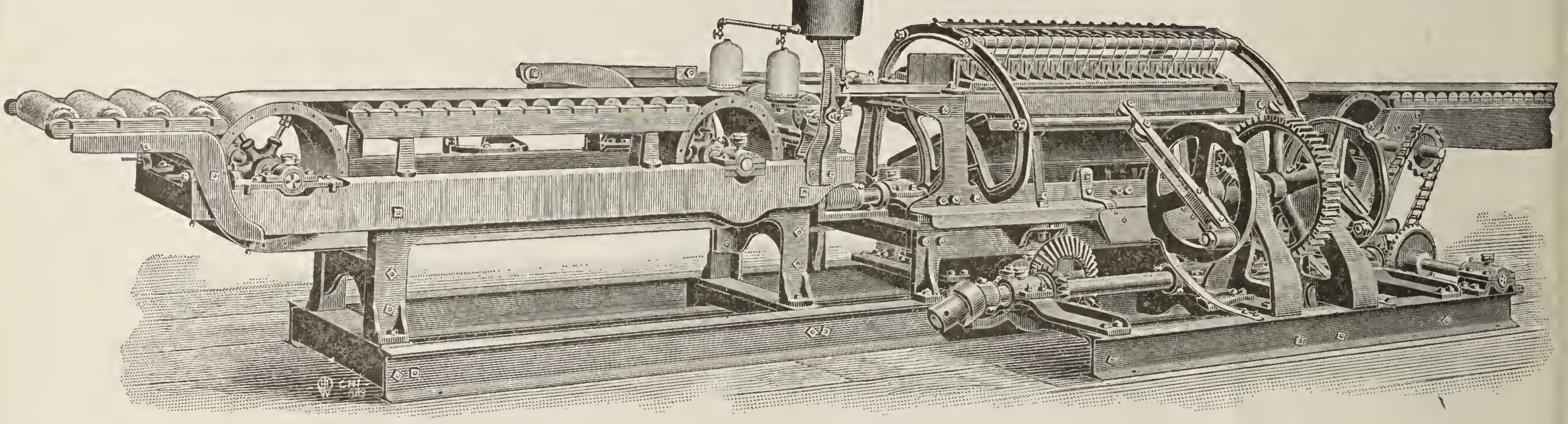
FOR FURTHER PARTICULARS ADDRESS THE

RELIANCE MACHINE AND TOOL WORKS

ST. LOUIS, MO.

GOOD CUTTERS

A good automatic brick cutter must involve two features. It must do its work well and it must be simple. If it doesn't do the work required of it well enough or rapidly enough, it is no good, no matter how simple it is. If it does do its work well enough and rapidly enough, but on account of mechanical complication fails to stand up to its daily requirements, it is no good.



THE BREWER NO. 60 SERIES

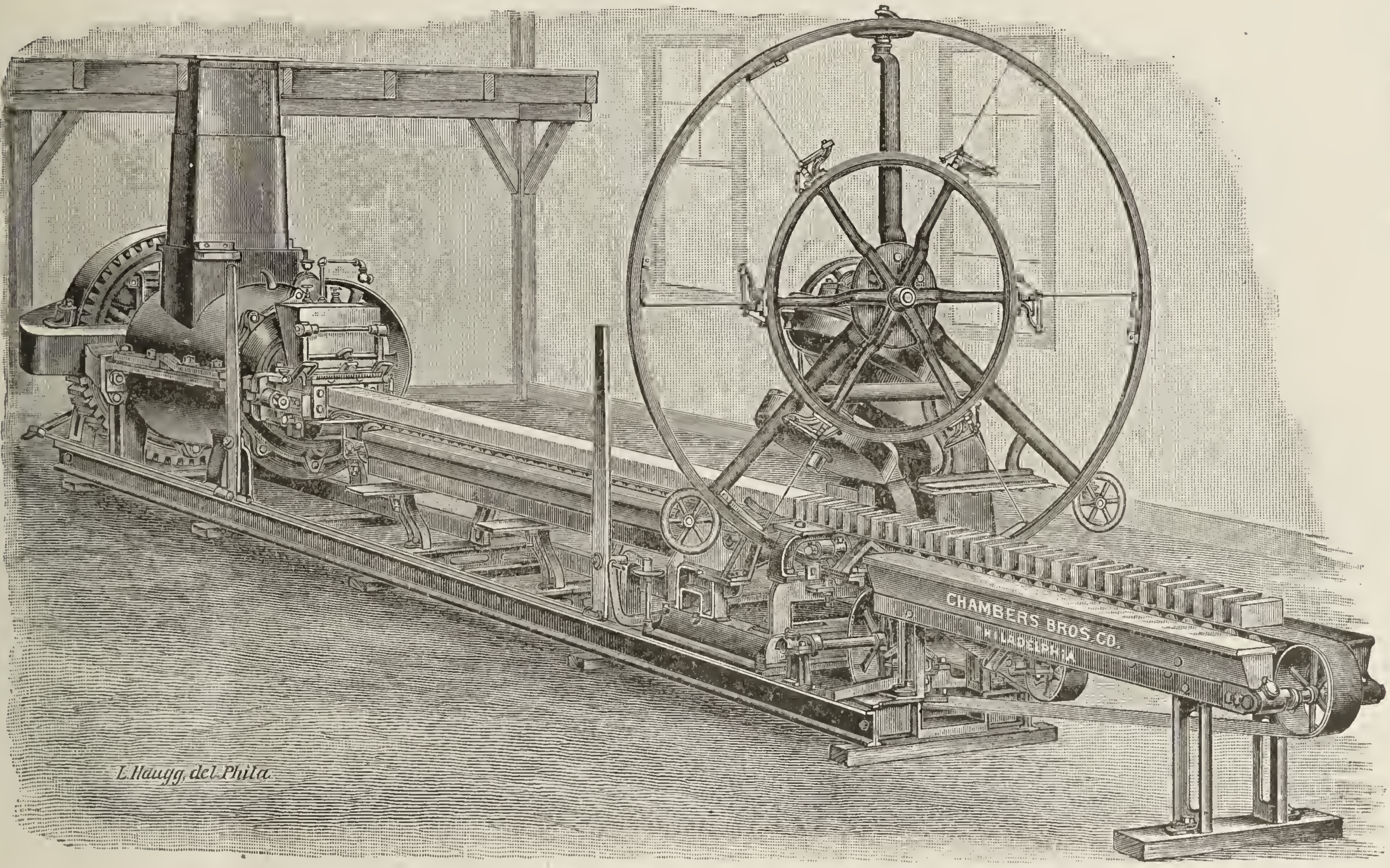
is made up of three different sizes of a most efficient and simple automatic brick cutter. It is no experimental line to be worked out at your expense, but one which you can see running almost anywhere you want to go; North, East, South or West. It is a practically demonstrated success, and is sold under a guarantee strong enough to suit anyone. Get references and prices. They are interesting.

H. BREWER & CO., TECUMSEH, MICHIGAN.

MACHINERY FOR BUILDING BRICK

AND FOR STREET PAVERS

ROUND CORNER PAVING BRICK WITHOUT REPRESSING


CHAMBERS BROS. CO.
PHILADELPHIA
L. Haugg, del. Phila.

THE CHAMBERS AUTOMATIC SIDE-CUT BRICK MACHINE.

Automatic End Cut Brick Machines of five sizes, having capacity from 10,000 to over 100,000 brick daily under favorable conditions.

CHAMBERS BROTHERS COMPANY

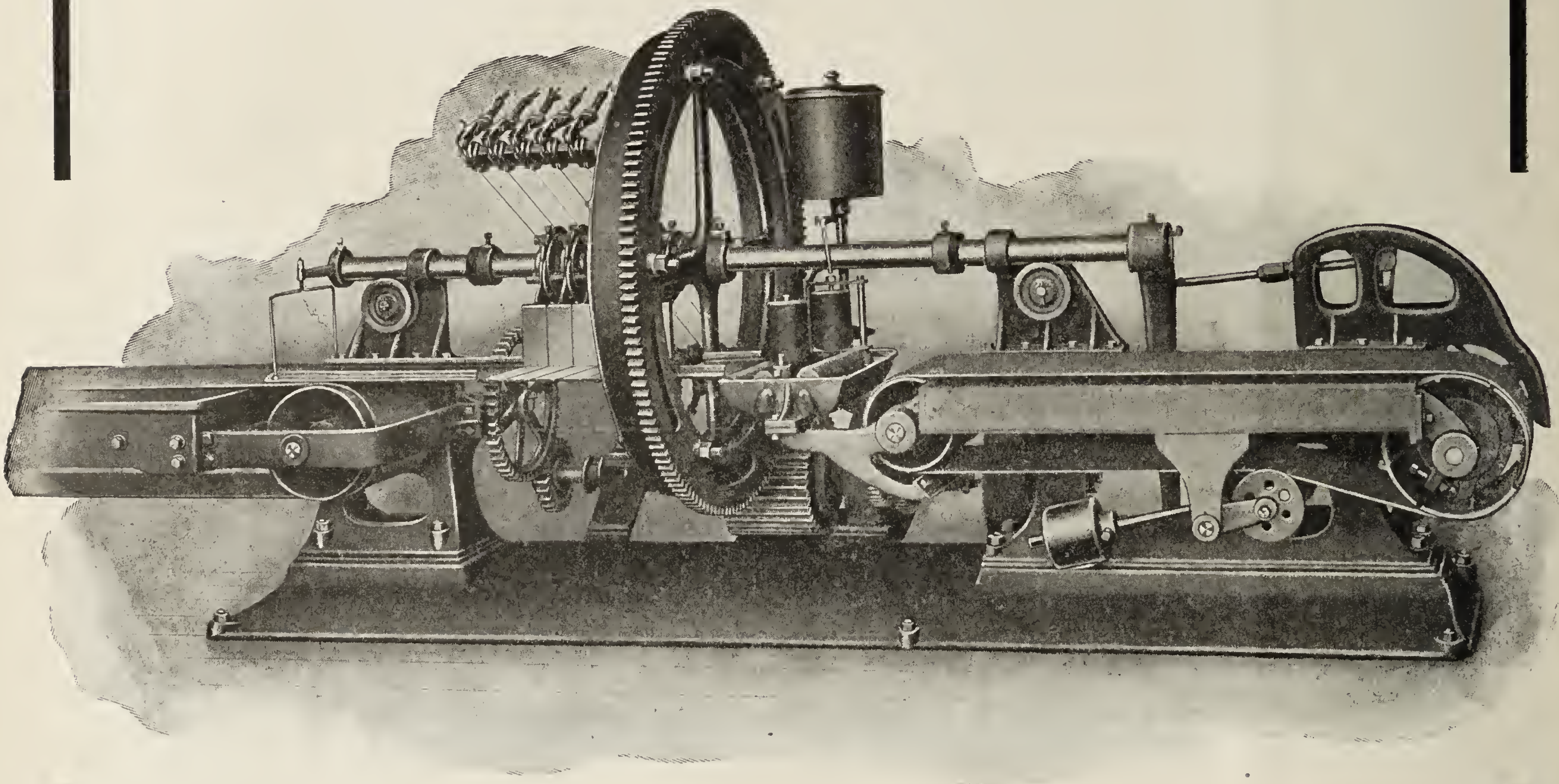
52D AND MEDIA STREETS
PHILADELPHIA, PA.

E. R. FRAZIER, Chicago Agent,
59 West Jackson Boulevard.

REVOLUTION IN

Automatic Cutters

Simple, Accurate, Light Running, Continuous Motion,
Perfect Brick.



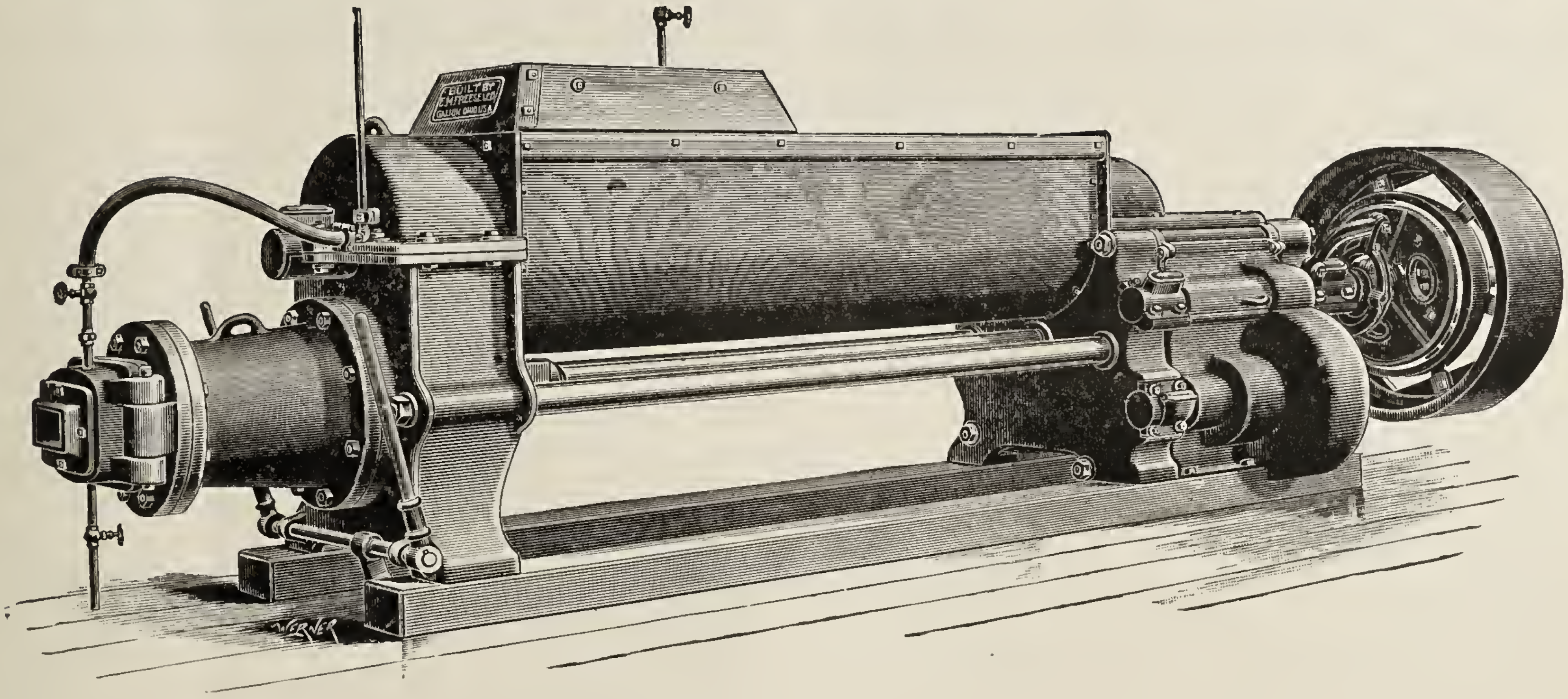
No. 25 Automatic Side Cut Brick Cutter.

THERE has never been introduced to the trade such a combination of excellent features, simplicity, accuracy and durability, as those embodied in our No. 25 Cutter. This cutter is beyond doubt the biggest value in cutters on the market today. Send for complete description. Our new catalogue is ready for distribution. If you haven't a copy send for one. It gives full information regarding our complete line of Dry Press, Stiff Mud and Soft Mud Brick Machinery, Roofing Tile Machinery, Sewer Pipe Machinery, Sand Lime Brick Machinery, Cement Machinery, Waste Heat. Steam and Hot Air Dryers and every appliance used in the clay trade.

The American Clay Machinery Co.

BUCYRUS, OHIO, U. S. A.

UNION BRICK MACHINES



We build these Machines in five sizes. Capacities to 10,000 brick per hour.

Several hundred are in everyday use. They do first-class work and are convenient, economical and durable. This can be verified by investigation.

We also build Brick Machines with separate Pug Mill.

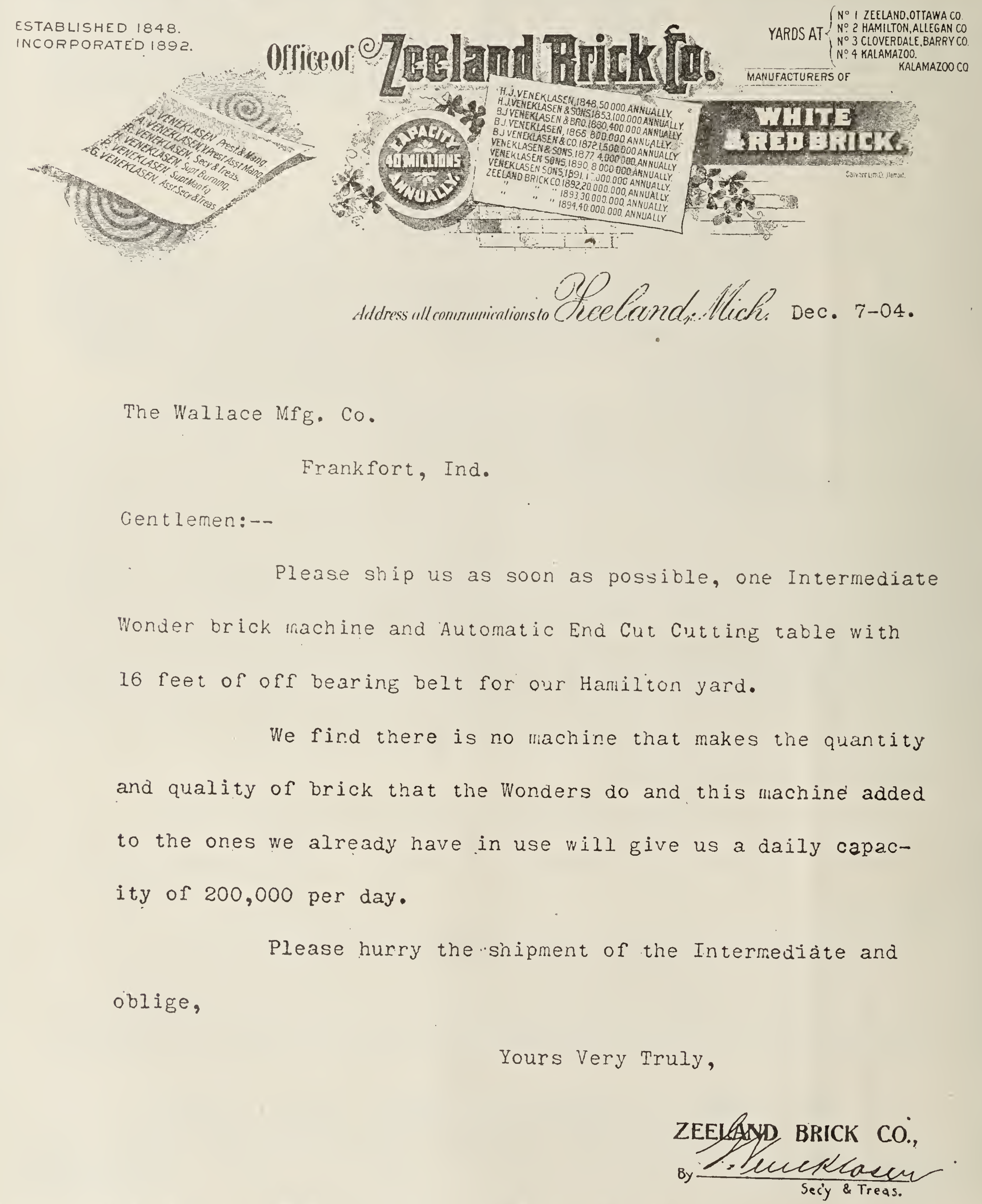
Don't forget our Automatic Cutters. **They give satisfaction.**

State your requirements and let us furnish particulars.

E. M. FREESE & CO.

GALION - - - - OHIO

WE PAVE THE WAY TO PROSPERITY.



ESTABLISHED 1848.
INCORPORATED 1892.

Office of Zeeland Brick Co.

YARDS AT
Nº 1 ZEELAND, OTTAWA CO.
Nº 2 HAMILTON, ALLEGAN CO
Nº 3 CLOVERDALE, BARRY CO.
Nº 4 KALAMAZOO. KALAMAZOO CO

MANUFACTURERS OF WHITE & RED BRICK.

J. VENEKLASEN Prest. & Mang.
A. VENEKLASEN, V. Prest Asst Mang.
R. VENEKLASEN, Secy & Treas.
H. VENEKLASEN, Supt Burning.
P. VENEKLASEN. Supt Manfg
G. VENEKLASEN. Asst. Secy & Treas.

CAPACITY 40 MILLIONS ANNUALLY.

H. J. VENEKLASEN, 1848, 50 000. ANNUALLY.
H. J. VENEKLASEN & SONS, 1853, 100.000. ANNUALLY.
B. J. VENEKLASEN & BRO. 1860, 400.000. ANNUALLY.
B. J. VENEKLASEN, 1866. 800,000 ANNUALLY.
B. J. VENEKLASEN & CO. 1872, 1.500.000 ANNUALLY.
VENEKLASEN & SONS. 1877. 4.000 000, ANNUALLY
VENEKLASEN SONS, 1890. 8 000 000, ANNUALLY.
VENEKLASEN SONS, 1891. 1[illegible].000.000 ANNUALLY.
ZEELAND BRICK CO. 1892. 20.000.000, ANNUALLY.
" " " 1893. 30.000.000. ANNUALLY.
" " " 1894. 40.000.000. ANNUALLY

Calvert Lith. Co. Detroit.

Address all communications to Zeeland, Mich. Dec. 7-04.

The Wallace Mfg. Co.

Frankfort, Ind.

Gentlemen:--

Please ship us as soon as possible, one Intermediate Wonder brick machine and Automatic End Cut Cutting table with 16 feet of off bearing belt for our Hamilton yard.

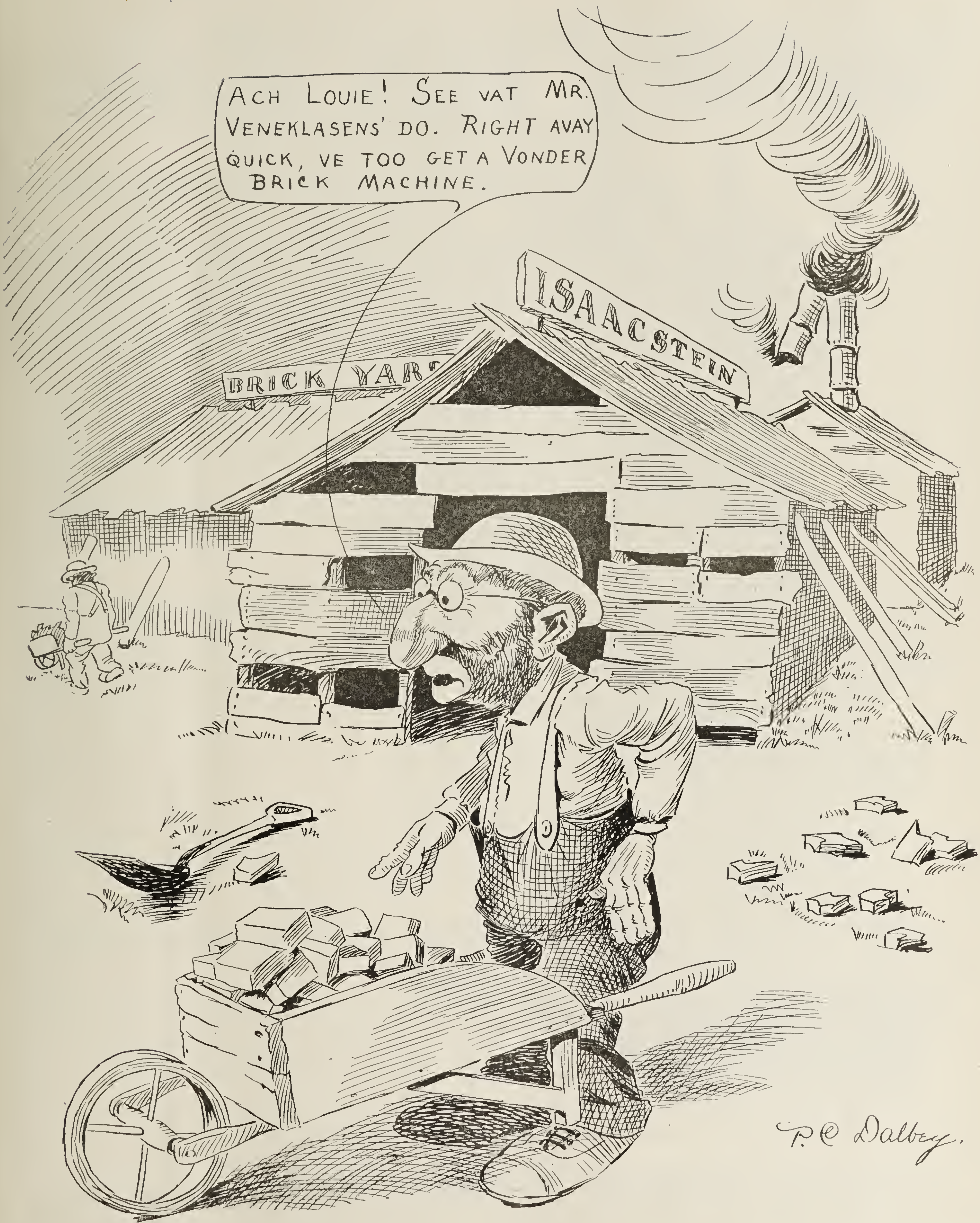
We find there is no machine that makes the quantity and quality of brick that the Wonders do and this machine added to the ones we already have in use will give us a daily capacity of 200,000 per day.

Please hurry the shipment of the Intermediate and oblige,

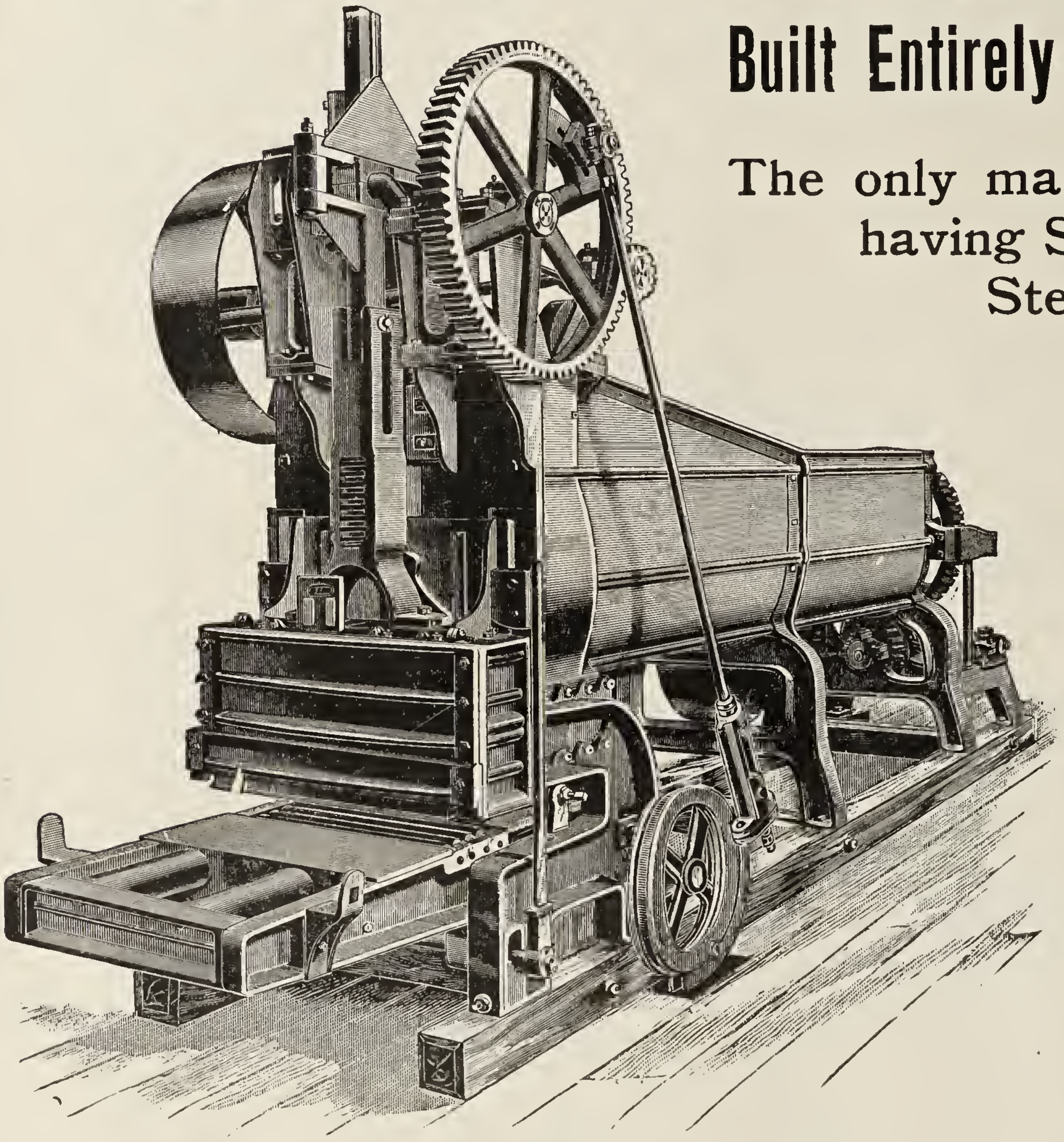
Yours Very Truly,

ZEELAND BRICK CO.,
By Veneklasen
Sec'y & Treas.

The Wallace Mfg. Co., Frankfort, Ind., U. S. A.


ACH LOUIE! SEE VAT MR. VENEKLASENS' DO. RIGHT AVAY QUICK, VE TOO GET A VONDER BRICK MACHINE.
BRICK YARD
ISAACSTEIN
P. C. Dalbey.

THE POTTS
HORIZONTAL BRICK MACHINE



Built Entirely of Iron and Steel.

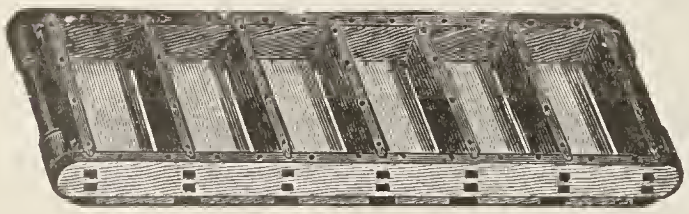
The only machine of this class
having Steel Gear and
Steel Shaft.

Built of the Best
Material by the Best
Workmen.

Simple, Strong and
Durable.

No extra pug mill required to enable working the clay direct from the bank. Its great strength enables working the clay as stiff as practicable, insuring brick which will be STRAIGHT and SQUARE.

THE LEADER OF ALL SAND MOULD MACHINES.



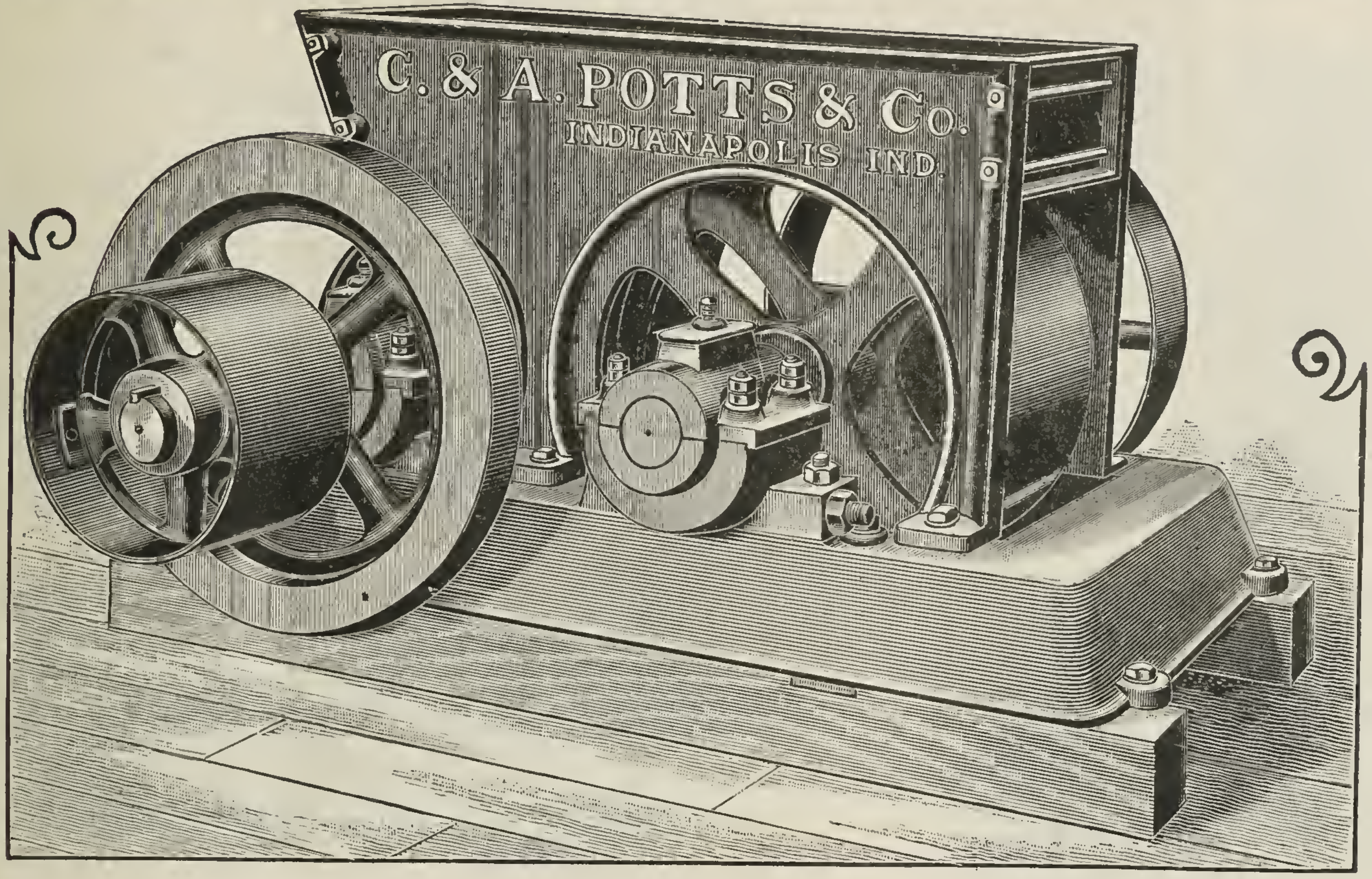
BRICK MOULDS A SPECIALTY

QUALITY IS OUR AIM.

We manufacture a complete line of Brick Yard Supplies. Write for prices.

C. & A. POTTS & CO., Indianapolis, Ind.

THE POTTS DISINTEGRATOR


C. & A. POTTS & Co.
INDIANAPOLIS IND.

Is not a spite machine, but is built the best possible. Having Heavy Chilled Rolls, Ring Oiling Bearings, Shafts of Steel and large in Diameter. The most successful machine for grinding out sticky clays and separating the stone.

THE POTTS MOULD SANDER

Simple in Construction,

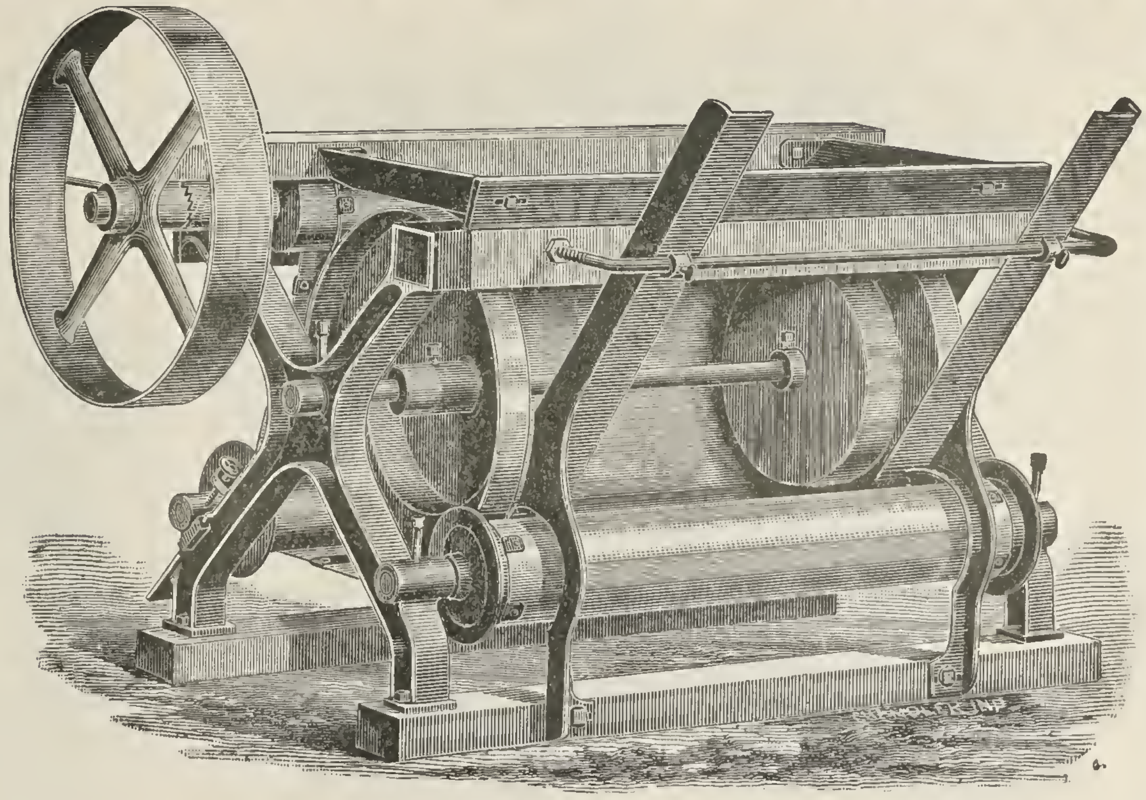
Strong and Durable,

Sands the Moulds Perfectly,

Never Strikes or gets Drunk,

Always Ready for Work,

No Brick Machine Complete without this Machine.



Patented February 5, 1889.

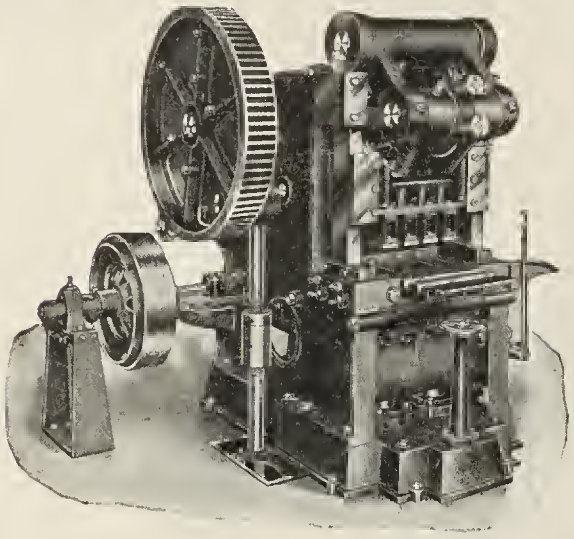
We make a specialty of equipping Sand Mould plants complete. We are the largest manufacturers of this class of machinery in the world. Write for prices.

C. & A. POTTS & CO., Indianaoplis, Ind.

Built Right Run Right

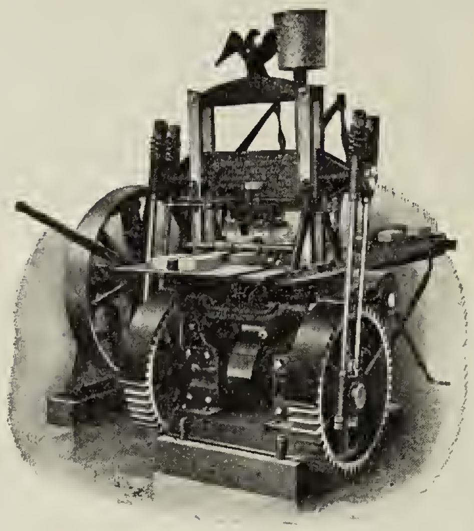
The American Clay Machinery

These are a few of the many Superior machines we manufacture for the Clay Trade. Large cuts



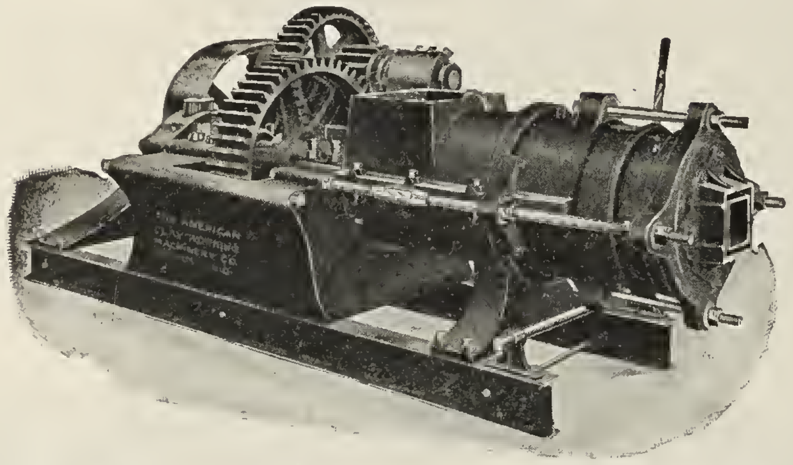
DRY PRESS BRICK MACHINERY.

We build a full line of Dry Press brick machinery. We have four styles and eight sizes, ranging in capacity from 1,000 to 3,000 brick per hour. This cut is our four mold, Moldel B press, especially adapted to Sand-Lime brick. Write for complete catalogue.

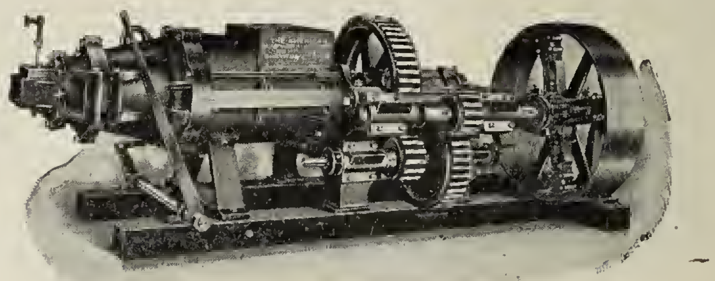


REPRESSES.

We build a large and complete line of represses in six sizes and styles. Capacity runs from 600 to 2,500 brick per hour. Send for our complete catalogue. This cut is of our double mold Eagle Repress.

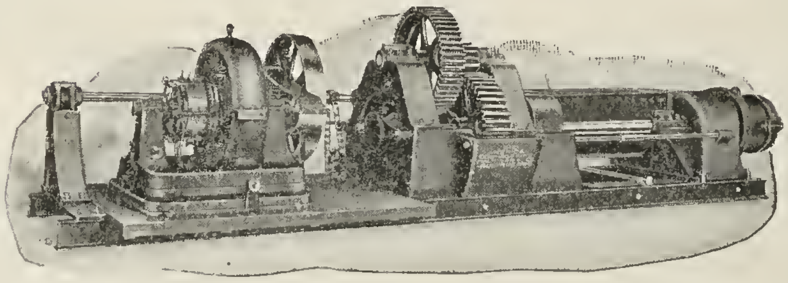


No. 40 AUGUR MACHINE FOR HOLLOW WARE.



No. 2 GIANT AUGER BRICK MACHINE.

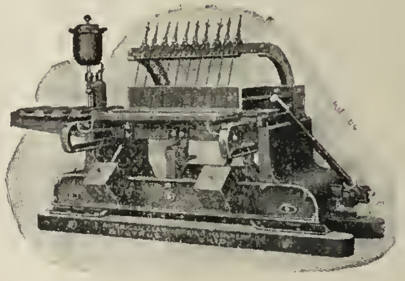
We build ten sizes and styles of Auger Machines. Capacities 1,500 to 10,000 brick per hour. Write for complete list.

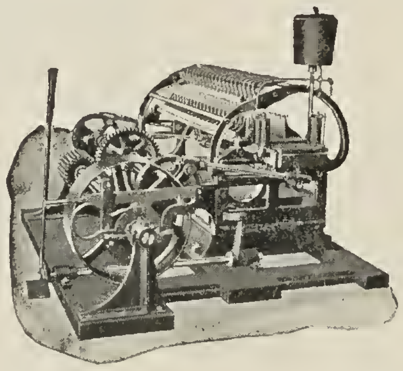


No. 23 ELECTRICAL DRIVEN, LOW FRAME, COMBINED MACHINE.

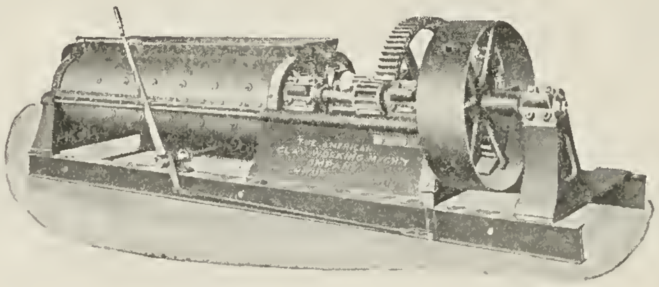
We make a full line of electrical driven clay-working machinery. Send for catalogue.

SEMI-AUTOMATIC AND HAND POWER CUTTERS





We make twenty-five styles of semi-automatic and hand power cutters for brick, tile and hollow ware. Write for full list and description.

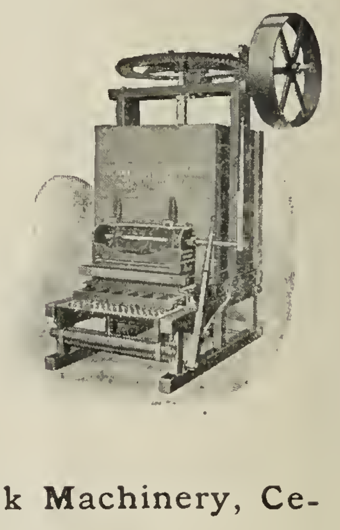


No. 38 DOUBLE SHAFT PUG MILL.

We build twenty different styles and sizes of pug mills to suit the needs of varying clays. Send for complete list and description.

SOFT MUD BRICK MACHINES.

Our Eagle Steam and Horse Power Brick Machines are the best built for small capacity. They are complete with molds, etc. Write for our soft mud booklet. These machines are especially adapted for export.

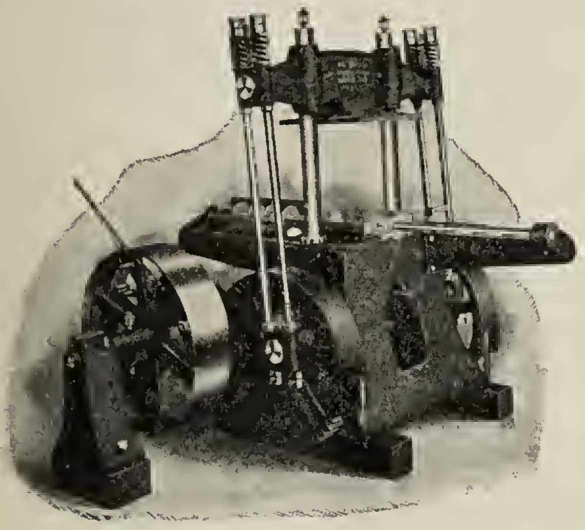


Built Right Run Right

Dry Press, Stiff Mud and Soft Mud Brick Machinery. Sand-Lime Brick Machinery, Cement, and Pottery Machinery. Waste Heat and Steam Dryers
Everything needed by the Clay Workers.

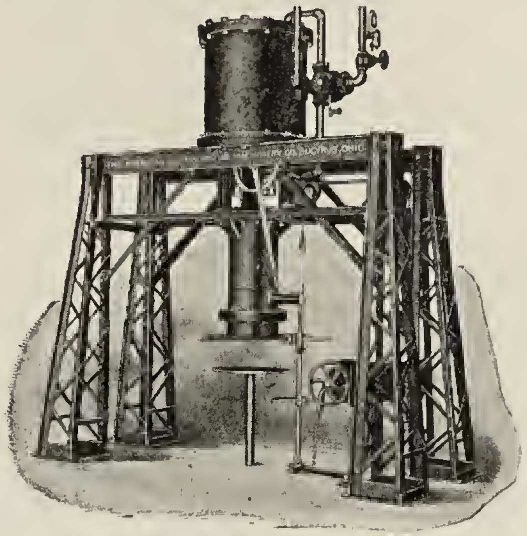
Company, Bucyrus, Ohio, U. S. A.

and full descriptions of these and a hundred other machines we make will be sent upon request.



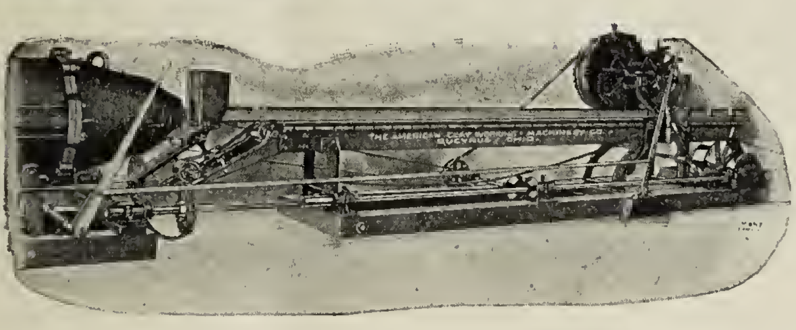
ROOFING TILE PRESS.

We build four styles of Roofing Tile Presses for the pressing of Hip Rolls, Crestings, etc. Write for complete description.



SEWER PIPE MACHINERY.

We build three styles of Sewer Pipe Presses, together with all appliances for a complete plant. Send for our big catalogue.



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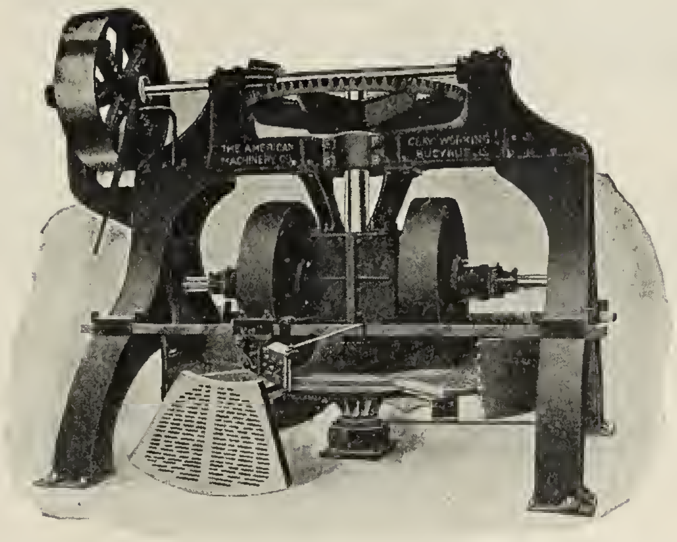

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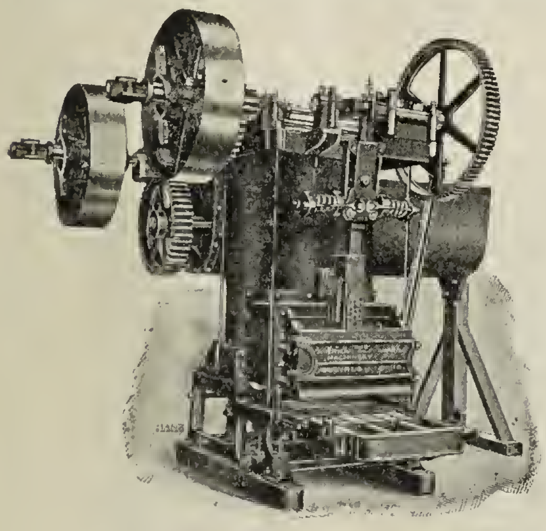

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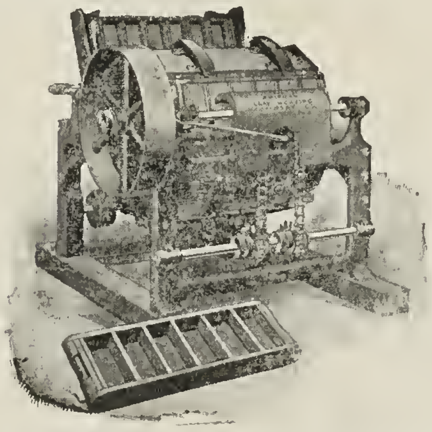

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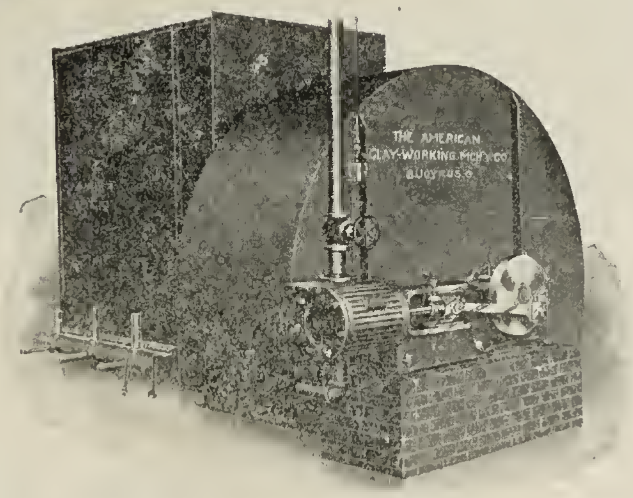

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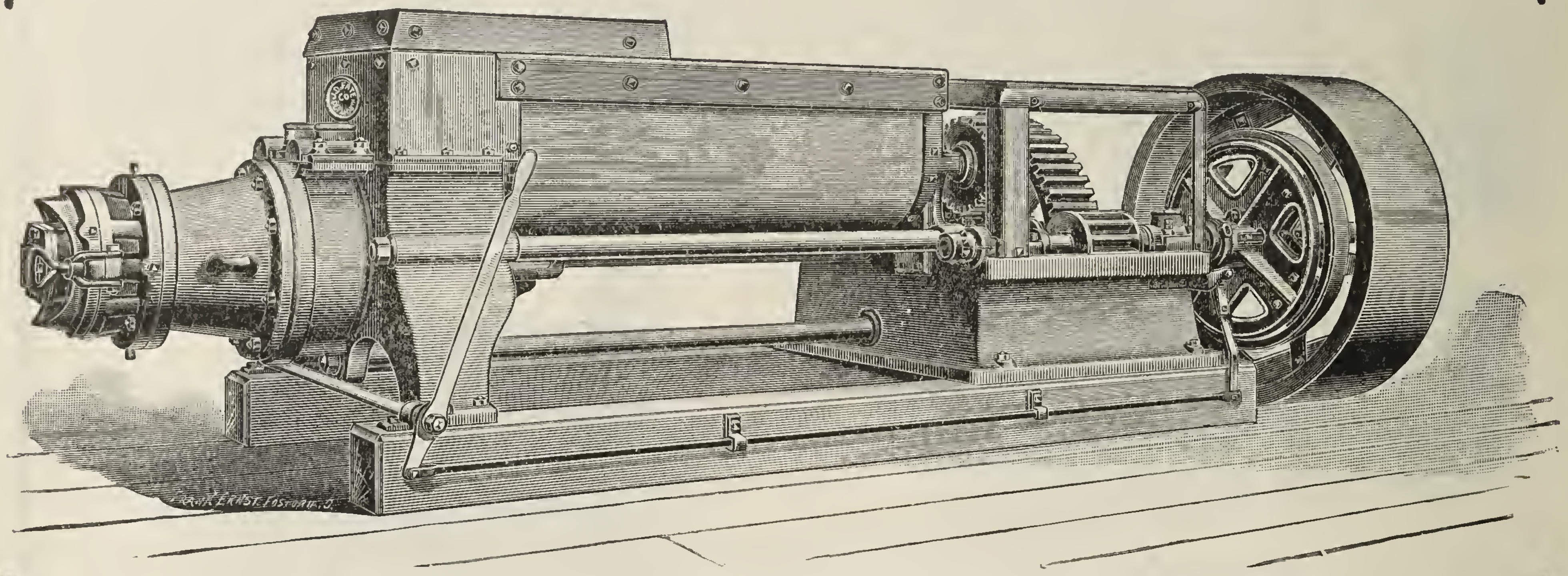

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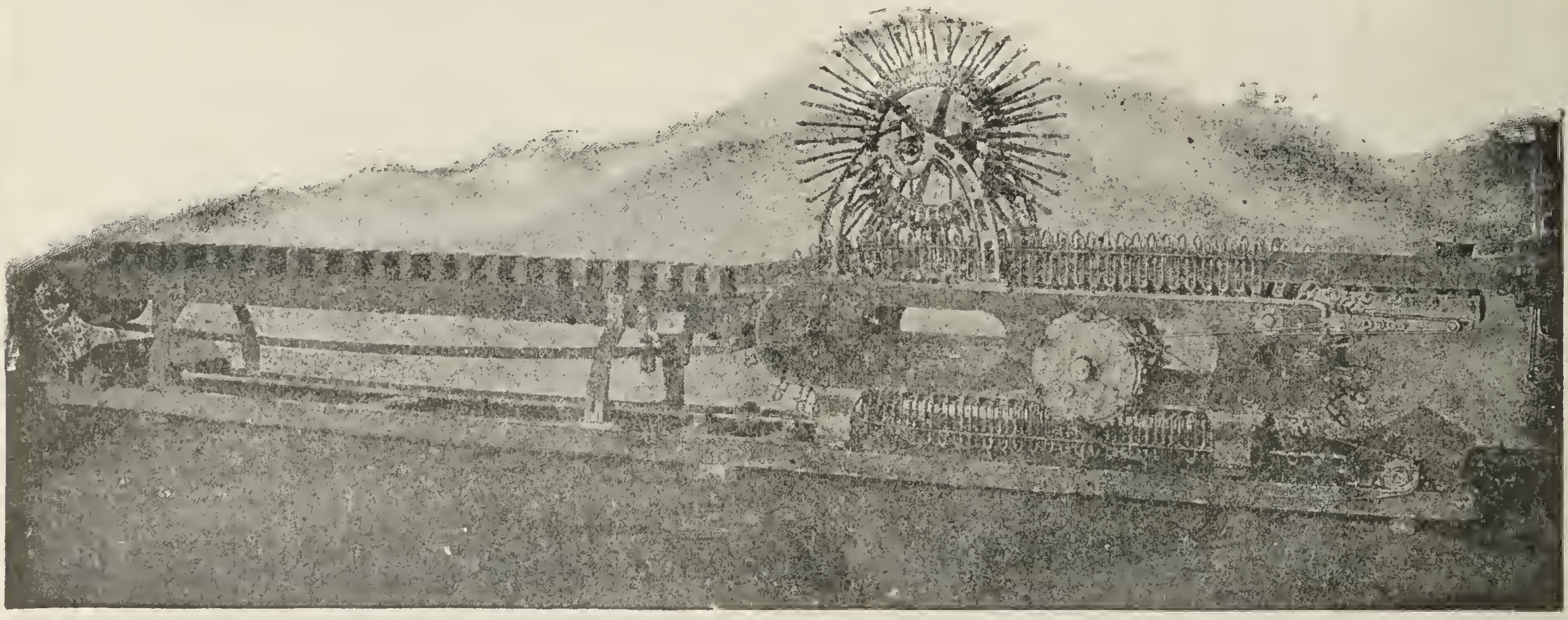

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Vol. XXVI. No. 2. CHICAGO, JANUARY 30, 1905. Semi-Monthly, $1.00 per Year
Single Copies, - 10 Cents

A REPORT OF THE SECOND SESSION OF THE ILLINOIS CLAYWORKERS' ASSOCIATION.

The second session of the Illinois Clayworkers' Association was called to order by President Butterworth at ten o'clock, January 11th, in the Elks Auditorium at Champaign. He announced that the first business before the convention was the appointment of committees, and named for the Committee on Resolutions J. H. Mamer of Campus; C. C. Barr of Streator; L. P. Whitney of Terre Haute, Ind. The first paper on the program was "Concrete *vs.* Brick," by Mr. Will P. Blair, of Terre Haute, Ind. Mr. Blair's appearance was greeted with applause. Before beginning to read his paper he said:

Gentlemen: I was about to offer a kind of half way apology for this paper, but I believe I shall not. You know very well that I can not treat this subject from a technical standpoint. I can only handle it from my own experience and ability. I have no technical education and no ability whatever in directions such as you would expect from Prof Talbot, or Prof. Fox, who kindly favored us with the papers yesterday afternoon. So you will have to take just what I have been able to give you.

BRICK VS. CONCRETE.

In nearly every technical trade journal having a relationship to building and construction we find the question—almost an absorbing one—what shall be done to best eliminate, to reduce to a minimum, the evil, disastrous and objectionable effects of contraction and expansion exhaustion in cement concrete construction in the various intricate and extended uses to which cement concrete has been put during the past few years?

We think we find the best answer to the question in the leading editorial in the October number 1904, of the *Carpentry and Building*, which declares "many engineers and architects are of the opinion that the use of concrete is being carried too far." The remedies suggested to prevent the cracks due to expansion and contraction of concrete are as many and varied almost as the jobs that are constructed from this material.

There is, however, this one thing conceded by almost every writer and critic upon the subject that if cement mortar is used slowly and in small units, or thin layers the trouble from contraction and expansion never occurs and no fault in such cases ever has to be remedied.

In such cases the only problem—of simple and well known solution—is to mix the cement with its constituent parts to make a high grade concrete mortar, developing its strength and adhering qualities in the highest degree.

To illustrate, a cement mortar joint ¼ of an inch in thickness binding together two brick in a wall the contraction takes place rapidly and in a short time, so in a wall where occur many joints: such contraction follows the course of construction so that a wall when completed stands with the contraction at a minimum it can protected with a course of non-porous brick—poorest possible conductor of heat and cold—thus reducing the contraction to a minimum, and no damage resulting to the building as a whole, but when a great mass of concrete is rapidly built up as in the case of heavy foundations, bridge piers and such structures no method of mixture has yet been found to eliminate or avoid the absolute certainty of an amount of contraction sufficient to mar if it does not seriously damage the utility and permanency of the structure.

The many recent tests and technical investigations by eminent men in such lines have been limited to collateral and primary facts not having proceeded to the extent of ascertaining the actual co-efficient of value as compared with that of brick.

So far the larger cement concrete efforts in the way of buildings in this country, notably the New Hotel at Dayton, Ohio, and the Ingalls Building, Cincinnati, Ohio, have been used largely to exploit the use of cement concrete in other structures. The truth about these buildings is never told in efforts at such promotion. The Dayton building is brick veneered from top to bottom, so in the case of the Ingalls building, being marble three stories and brick from the third story upward.

While there is no way of determining the relative crushing and tensile strength of the iron, concrete and brick in these buildings, yet as a coefficient of value in place I hazard the opinion that the brick is much the greater. One thing is prominently suggested by the facts at any rate.

The assurance to the capital invested in these buildings was the brick and the iron. So in the case of the concrete smoke stacks built in this country. This language was used by "Power," a leading technical journal of this country: "The calculations are based by the engineer on the ability of the steel frame to resist all bending forces."

There shall be no effort on our part either to reduce, belittle or in any manner displace the uses of cement along the lines for which it is rightfully and well adapted.

The truth is, cement in various uses is the brick-maker's best friend, but along the lines where brick and clay goods are evidently and unquestionably the best we shall endeavor to draw the line against a questionable substitution of cement concrete.

That special efforts to enlarge the use of cement concrete to the widest extent by its re-enforcement with steel for structural work and many concrete foundations, etc., will prove a wise move on the part of the manufacturers of cement in the long run, is not the province of this paper to discuss.

The prime object, of course, on the part of the manufacturer is to promote increased cement sales. From a series of inquiries with relation to such extended uses as developed to date, first ascertaining what the object of its use and what purpose, if any, is achieved we may determine whether or not such substitution is called for in the interest of the man who pays the bill.

The object on the part of the owner of any structure in building with cement is the thought of its being better.

Is it better?
Is it cheaper?
Is it more durable?
Is it stronger?
Is it always adapted to its purpose?

Will it withstand the action of all artificial and natural destructive forces?

What interest of value is attained by the use of concrete over that of brick in conserving the wide range of interest sought by every man who contributes his means to structural work as an investment?

Is it better?—Is it cheaper?—No! Even at the present price of cement it is not cheaper unless made so by the sacrifice of quality. You can make it very, very cheap, it is true. You can likewise make a brick job very cheap. In the latter case, however, the cheapness is much more easily detected. Is it better?—Is it more durable?—Not more so.

In skill both in the manufacture and the application of cement concrete, the hazard in having good work done is decidedly in favor of the brick work, but taking it for granted that such work respectively has been carefully done and with more than average skill, what then? As before stated, scientific and technical data has not kept pace with the risks that commercialism has been willing to assume, so we are left largely to the judgment of observation, comparison and reason to sustain us.

A Vitrified Brick Flat Arched Bridge.

The writer a few days since examined the re-enforced concrete bridge at Dayton, Ohio, now but a few years old. The same shows, in its present contracted conditions, thousands of cracks and shows also hundreds of spalls, the whole doubtless due to compression resulting from expansion. On the abutments hang great icicles formed at places where the water has percolated through the pores of the concrete, showing in some instances where the wall has spalled off, due to the freezing.

Just what is going on in the way of corrosion of the re-enforcement of this bridge one can but imagine, but the whole presenting an aspect which compared with some of the stone bridges of Europe five hundred years old would declare their juniority.

Within a few hours of examining this sample I had an opportunity to examine two vitrified brick bridges, which we illustrate, not having so many arches or spans nor quite so long, but sufficiently long for a fair comparison, the spans being thirty feet made up with small Portland joints in mixture of one to three. The brick impervious, poorest conductors of heat and cold, expansion and contraction always at a minimum, being about one year older than the Dayton cement bridge, but now standing without a single defect perceptible to the eye. Not even with the aid of a magnifying glass can one observe disintegration, cracks, voids or spalls. Watching many other examples with the greatest possible scrutiny, as the ones taken are not exceptions but entirely within the rule, in the exercise of fair judgment one may conclude that no change to any discernible extent will be brought about by the ravages of time and use in case of the vitrified brick bridges at the expiration of one hundred years; but the ravages of the elements will have wrought such disaster, in the case of the Dayton bridge, as to require a new one, not to say anything of the numerous and expensive repairs that will be called for every few years intervening. These examples and conditions are found only by the engineer and the man of affairs who sees as well as thinks. It is to these we must appeal; it is from these that we confidently expect the merit of our goods to be justly awarded their proper place in ultimate conclusion.

Is it better?—*Is it stronger?* The small fragment I have before me—actual piece of masonry-brick, bound together with cement and sand mortar in proportion of one to one, in which the cross breaking strength of each brick alone exceeded in test 60,000 pounds and 35,000 pounds compressive resistance to square inch, and absorption of the brick used less than ½ of one per cent, yet, bonded together as it was, the brick and cement mortar stood as one body of equal strength. Now if this were entirely of a concrete as rich as in these fractured joints the cost would be entirely prohibitive, and the contraction and expansion so great that its elastic limit would be passed by such force.

Is it better? Is it always adapted to its purpose? No. We have had a dry season, a concrete wall in the construction of a house costing about $4,000, now 2 years old, has not yet dried out on the side of its northern exposure, and the paper refuses to stick to the wall. In case of concrete foundations and ceemnt block the work of decay commences with the wall plate as soon as the same is put on and never lets up until the doors become too tight at bottom or at the top near one corner, the plastering cracks and the paper splits, and the two never ending troubles continue as a family nuisance as long as you live in the house.

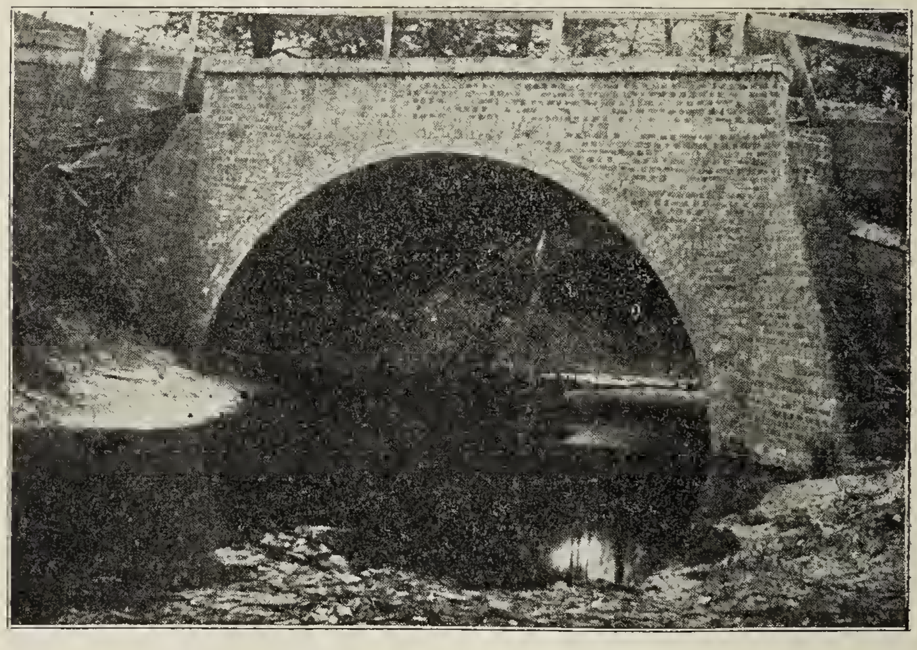
Set your boilers with broken stone concrete, as many have done, using stone heavily charged with lime. In due time and a short time you have converted your boiler room into a lime kiln and down comes the walls, the result of almost criminal thoughtlessness.

In the use of granite or flint the expansion and contraction would result in an early crumbling.

I read recently a reply made to an inquiry by some one having such experience that the best way was to grind or break up old fire brick for making the inquirer's next wall and there would be no trouble—as if it were an improvident thing to use whole ones. What will happen to the broken stone concrete building caught in an intense fire? You know a veritable lime kiln will be the result. If you do not believe it or if you do believe the cement concrete, a better refractory element, each one of you should not hesitate to construct at once your fire pockets of concrete and discard your old, true and fire-tried clay brick which you have found are scarcely affected by a series of a hundred fires with ever changing temperature above and beyond anything experienced by either Chicago or Baltimore. If you think large units of concrete have good refractory qualities build a kiln with extra large mortar joints and see how soon it will fall.

You know, we all know, from actual experience and observation of the results, how disastrous they are, how expensive and indiscriminate and unwise use and substitution of cement concrete in place of brick will prove.

It is for us, whosever interest it is our duty to guard, to let these facts be known in an emphatic manner, but not alone in conserving our own interest will our efforts extend, but our customers' general welfare, whose confidence we esteem, will be all the more secure by the timely warning.



A Vitrified Brick Circle Arched Bridge.

Nor does the whole difficulty with this indiscriminate use of concrete lie with the concrete itself, for the re-enforcement, to be secure in its primary worth, must remain free from corrosion.

I have read carefully evidence, from more than 100 witnesses, experimental in character, that certain existing conditions show no corrosion has taken place. In others extreme destruction is the case.

Prof. Charles L. Norton we believe has furnished the best deductions from his experiments along these lines. I will state them:

First—Neat cement is a perfect protection.

Second—Concrete should be dense without voids or cracks, and be mixed wet.

Third—The corrosion found in cinder concrete is mainly due to iron oxide in the cinders and not to the sulphur.

Fourth—Cinder concrete, if free from voids and well rammed, is about as effective as stone concrete.

Fifth—It is important that the steel be clean when embedded in concrete.

Sixth—It is essential that the steel be coated with cement before embedding in concrete, the unprotected pieces of steel being found to consist of more rust than steel.

The foregoing analyzed carefully, paradoxical though they are, means that scientific research has not reached a stage of development in which conditions can be read with that full knowledge necessary to determine with any degree of accuracy the safety factor of value. Until this is done the hazard exists and will continue to exist. But the Chinese wall made from more than 100 varieties of clay, the prehistoric pottery of the western continent, the ruins of Ninevah and the evidences throughout the Christian era of durability, strength, beauty and the extraordinary and intelligent workings of clays in the present entirely and unqualifiedly eliminate all hazard and all doubt in the use of brick for the vast majority of structural work.

THE PRESIDENT: Is there any discussion on this question?

MR. MARTIN LAUER: About four years ago I had the pleasure of preparing a paper for this convention on Hollow Building Blocks *vs.* Frame. I believe, if I had been called upon this year, the question would have been Hollow Building Block *vs.* Concrete Block. I am somewhat proud of my membership in Illinois Clay Workers' Association, although it is recent, because clayworking is the first Art of which we have any record, and the clay industry, judging from Scripture, came from the Almighty Himself, and I believe the clay-workers are followers of that Art. We are told that the Almighty first mixed the Earth, and made the greatest product that the Earth has ever seen—Man. I cannot comprehend why the clay journals, whose field of endeavor is supposed to be clay goods, devote column after column and page after page to a discussion of the subject of lime brick, sand brick, concrete brick, and what-not, and everything, but gold brick. But that is their business. I was very much impressed by Dr. Converse's little talk at the banquet last night about the "Babes in the Woods," and I want to confess that I have been a "babe in the woods," and it took me several years to shake off the leaves and rub my eyes and wake up.

My business, as you will probably find out before I get through, is the hollow building block business, clay brick, vitrified clay brick, impervious clay blocks, the best made. (Applause.) When I first went into the business I was going to get posted, and so I took up the clay journals and the technical papers and listened attentively to the enlightenment of the clay machinery man, and became impressed with the ideas that building block, or, as it was then called, "machine terra cotta" (I like the name, it sounds well), were adapted for making anything in the building line. In fact, you could construct the most artistic church of it, including the steeple, cross, and everything except the lightning rods. And I started out on that idea and took it up. I soon found out that there were things that you could not use hollow building blocks for. I found out that you could not substitute a building block for hand-made terra cotta, that you could not get the effect; that here was a field that belonged exclusively to hand-made terra cotta, and you could not go against it. Then I began to come down and throw off a few leaves. After awhile I got down to an ordinary 13 story office structure. In fact, Frank Abbott, one of the best architects in the city of Chicago, made a set of plans for a 13 story building in Chicago. He figured, I think, 14 days and nights on that job. But fortunately for the building and the owner, there was some difficulty in getting the money, and all that was left was a set of plans. We finally got down to finding out just what hollow building blocks were adapted for, just that class of construction, and we have found limitations. They are adapted for basement foundation, and the construction to house. Where the sketch and the plans are drawn with a view of using the hollow block, you can get an ideal building of nice design and altogether a modern, sanitary and architecturally beautiful building. I want to say here you can not get that kind of a building of any other material in the block line, concrete, cement or otherwise, that can approach it in cost. I will give a concrete man a chance to tell me otherwise in a minute.

I said I was a "babe in the woods" and woke up. Then the idea of theoretical beauty and so on was proposed by the machinery man,—I can understand why he did it. He wanted to sell a great many dies, and if he could get the manufacturer to believe that he could build almost anything, why, the manufacturer would get busy and buy the dies, and a lot of them did so, and would like to turn them back to the machinery men for a fraction of what they cost, but of course the machinery man won't take them back.

Now, we are confronted today by a proposition of the concrete block. I was trying the other day to take an inventory of the number of concrete block machines that were on the market. I finally called my dog over, and I said, "Come here, Pretty, and let me count your hairs," and I gave that up. There are just about as many different concrete block machines as there are hairs on my dog's back. Of course, these men want to sell machines, and I don't blame them. They tell everybody "you get one of these concrete block machines—get my machine—take it over to your ward, get a wheel-barrow full of sand, get some cement, get a laborer for a dollar and a half a day, you will probably find somebody loafing around the station platform who will work for a dollar, throw in your concrete, work it down, and out it comes; you can turn out five thousand a day." Figure it out yourself; it will be only a short time before you will be wealthy. (Laughter.) Well, I do not blame them. I wish I was in the business, and I may change my business yet if I can get a chance to break into the other and make money. I don't want to throw brick at concrete in a general way. There is not any question but what there is good concrete, and well-made concrete is a good building material for its purpose, and in its proper place. But, as Mr. Blair has said, good concrete costs money. Anything good costs money. And in order to make money in making concrete blocks, it undoubtedly would be the purpose of a man to produce those blocks as cheaply as he could.

There are a good many who come here for information. I didn't come here to give any. I haven't got much to give. There are a good many concrete block men here. We have concrete blocks on exhibition. I want to say that I am from Missouri. I want to be shown, and after you have shown me, I will acknowledge the coin if you are right. I want to ask the concrete block men here, to tell this convention the advantages of concrete block over impervious clay brick, and what is claimed for concrete block that is not achieved by an impervious clay brick. My purpose in getting up here was not to hammer the concrete block. I believe that the concrete block is going to help the impervious clay block for this reason: When I first went into the business you couldn't talk hollow blocks to anybody. They wouldn't listen to it. They wanted the solid wall, 16" to 24" thick. Nothing less would do. If it was Purington's block, they might stand for 8". (Laughter.) But after hammering away, and going without lunch for several years—profits were too slim—they finally began to think that a hollow wall might be all right, and they finally came to us. Now, for that reason I will take off my hat to the concrete block and concrete machine man. They will help educate the people to the fact that hollow construction is good construction, and then we will take a chance on showing the fellow who believes that hollow construction is good construction whether or not the impervious clay block is not the better to use than concrete construction. I want to caution the clay-workers here against jumping into the manufacture of concrete blocks. You are working at the Art which the Almighty invented. It is a good Art, and don't be "babes in the woods." (Pardone me, Dr. Converse, for borrowing that expression.) Don't jump into this thing and see great piles of money in it. What the machinery man wants to do is to sell you his machinery, and as many of you as he can get hold of. Be careful of him. He is going to make money every time he sells a machine, but you don't know whether you are going to make money until after you have tried it, and you may have to try it for some time.

There is one question I said I was going to ask the concrete block man, or the machinery man: That is, what advantages he claims for the hollow concrete block? From the paper read by

Prof. Fox, we see the destructive effects of moisture and freezing on sand-lime brick. In coming into the hall yesterday my good friend Hammersmith said he had one of the concrete blocks over there and he wanted me to see it. When I came in this morning I saw Hammerschmidth wasn't here—maybe I wouldn't have done it if he had been here, because he is a pretty big fellow. I got a cup of water just merely to see what relation there was between water and concrete. I found out that there was a very close relation. I poured the water onto the concrete block and the water was gone. Somebody who stood by said "Gee whiz! where has that water gone to?" I said "I don't know, but I will get some more and pour it on," and pretty soon he said, "Why, it is here, it is coming through the bottom." (Laughter.) There was another block here which has a cement face on it. I said "We will see about this." I have never seen a piece of concrete, no matter who made it or where it was made, that you could not put water in. I got a dipper of water and I put it on that block, and the effect was the same. Then I tried the other agent's block over here—It liked water, too—and that took to water naturally.

I want to say that I have no ill-will against the concrete people, the block machine men. Not at all. I say, go ahead, but don't misstate things. If you are a "babe in the woods" and believe it yourselves honestly and conscientiously, go ahead, because the other fellow will find it out. It may cost him some money, but he will find it out, and, Mr. concrete block man, you will save us lots of money because you are going out over the country and you are going to educate the people to the use of the hollow block. Now, we are coming along and we are going to put in the only good impervious vitrified hollow building block, made of clay. (Applause.)

Mr. R. M. Combs: There was a point brought out by Mr. Blair in relation to the Ingalls building at Cincinnati, regarding the enamelled brick used to face that building, and as a representative of the Tiffany enamelled brick company, I want to thank him for that, as not only the architects who design the building but other architects as well, have come to the conclusion that the best fireproofing that they can put into the building, whether it is concrete or common brick, is an enamelled brick made on a fire-clay body, such as the Tiffany people make. We find in Chicago that many of the sky-scrapers that are put up with alley elevations and where they join other buildings are faced with Tiffany enamelled brick. The property owners who adjoin these buildings think that it is done to throw light on their buildings and to reflect from their point of view. The truth of the matter is that it is put there as a fire protection in case their old shack burned down. It has been demonstrated in the fire at Baltimore that the enamelled brick, and brick of all kinds, stood the heat better than any other material. Therefore they have shaken off the leaves, as Dr. Converse said, and come out of the woods.

There was another point in Mr. Blair's paper which I wish to mention in regard to concrete block. Some years ago I was identified with a company near Chicago who made concrete blocks without the machine man's aid. We recast the concrete in very thin proportions to the consistency of thick cream, and poured it in a sand mould such as the moulders of iron use. We had magnificent results. Our samples were beautiful, and we secured many orders in Chicago for not only the ordinary walls but the highly ornamental parts of buildings that could not be produced in stone only under an exorbitant figure. These blocks were beautiful for about six months. Then there began to appear great cracks, like the fire checks in a brick, which took in all the dirt and water that came in contact with them. That alarmed us, and we removed them by rubbing another piece of cast concrete over the surface and filling up those cracks. That was all right until that washed out. We did everything possible to avert those cracks, but they kept coming and getting worse and worse, and somebody told us that it was because the blocks were made solid. Then we made them hollow. They said "Let the moisture out through a hole in the center," so we put that hole there, but the checks were worse than ever, and it was our opinion as dealers in that product that the best thing we could do was to get away from it, and our experience was so sad in that direction that since we have expended all of our energies that we wasted in that direction towards selling impervious brick, with a good deal better result. (Applause.)

Dr. A. L. Converse: I am not an Irishman, but I have been in Ireland, and I saw a company of young American boys and girls out of some of our schools. They had a "Paddy from Cork" right there hunting for shamrock. I thought I had an opportunity to play a little joke on those Americans, and I asked them what they were looking for. They said they were looking for shamrock. I said "I have been here for a little while, and if you will go with me, I will show you a large piece of shamrock." They came trotting along, delighted with the idea of finding some shamrock. I took them down to a piece of concrete pavement that was built around the depot. I hadn't paid very much attention to that shamrock myself until I got them down there. I said to them then, "There, that is 'sham-rock' for you."

Now, I was never so fooled in my life as I was in that shamrock. There was a piece of sham-rock that was about 75 feet long, and it must have been 20 feet wide, without a seam in it or a crack. I never saw so large a piece of concrete in my life. That kind of woke me up a little bit. And I found it in a number of places in Ireland, and I found the same thing over in Germany. We dare not put down a piece of concrete here without cutting it into blocks. We dare not put down a very large piece so as to give a chance for expansion and contraction. Still I want to tell you, gentlemen, that that concrete is put down there—I don't know how long it had been there, I don't know what it was,—but that concrete as laid there was without a seam, without a particle of disintegration, and in one body.

Mr. Blair: You will give us a whole lot of confidence if you will tell us how that was made.

Dr. Converse: I don't know that.

Mr. Blair: That is the point.

Dr. Converse: But it did convince me that there was something in that workmanship that was better than the work that was being done in this country, or else it was a better material. I found out this, though, in regard to concrete and the things that these gentlemen have said about the concrete blocks explain it. I believe if these concrete blocks were made smooth properly, we would find them much less impervious to water than they are when they are molded. I don't believe it is possible to mould a piece of concrete that will not absorb water almost like a sponge. Going over it with a trowel and trowelling it down while it is wet will make it impervious to water. I guess those of you who have tried that will find that it is so. I took a part in the building of a church not long ago, not much of a part, but I sold the brick and got my money for it. After I saw the structure up—I didn't see them put it up—I didn't know how they were going to do it, or anything about it. But there was a lot of paving brick there. I think they were impressed with the old hymn of "Christ, the Solid Rock I Stand," for they had taken those paving bricks for the building, and built a very beautiful church on a concrete hollow block foundation. If there was anything that was more ridiculous to my mind than taking material that will stand forever and putting it on a substitute, on a sham-rock, I don't know it—I can imagine nothing more ridiculous.

All over this country they are beginning to make chimneys of hollow blocks. I am getting pretty well along in years, but I expect to live long enough to see those chimneys go down, and if I don't, I shall be terribly disappointed. The idea of putting in concrete in a place that is expected to come in contact with fire is ridiculous. It isn't fit for boilers. It isn't fit for any place where it comes in contact with water. It isn't fit for anything where it comes into hard weather, unless that trowelling down process is done. (Applause.)

Mr. Van Hook; I cannot sit still and hear what is being said here, because I am a concrete block man from start to finish. I have been on the road 20 years. I have helped to introduce street pavements, and they have all been successful. Now, I am very much surprised at the brick men, at their real ignorance of the concrete business. Now, the gentleman who has said that it would not stand fire, if he had read the history of the Baltimore fire, he would surely know better. The government sent Mr. S. R. White, of Bloomington, there. He was there 100 days investigating the matter, and he reported that according to the insurance adjustment concrete stood the fire better than anything else that was in those buildings. That is all a matter of record. There are poor concrete blocks, and there are good ones. I suppose we are just like the brick men. There are some poor concrete block men, and some good ones. As far as I am concerned, I am going to try and be a good one.

I am guilty of selling Mr. Hammersmith his machine. I also sold the Citizens Coal Co., of Lincoln. There is something about the concrete block business; when you get into it, you need not think that you are getting into a snap, and you need not think that you can learn it in a day. There is no half way ground in the business. It is either all right or all wrong. There is one thing about it sure, that you need not put out a poor concrete block, because if you study your business and know it, you will know in 24 hours whether it is a good block or not. Now, the trouble of the concrete block business is this: You don't get good material to go with your cement, and there are few people who handle cement who know very much about it. They don't study the cement from the manufacture up. They don't know the nature of it, and the consequences are that they cannot handle it successfully, by not knowing it. I can't say that I can make a speech. I can answer questions perhaps better than I can talk. I want to say one thing, however, that if the concrete block men and brick men will work together, and if the brick men will investigate the concrete block business thoroughly, they will find that it will be of great advantage to them because a wooden house is practically a thing of the past, and you are going to find people who are faddists, and they are going to have concrete blocks, they are going to have concrete veneer. Now, just yesterday morning I sold concrete blocks for a wall that is a quarter of a mile long and ten feet high, and we have got as good brick men in our town as they have anywhere. I don't know why they didn't sell the brick. I know that I got double the money that the brick men could have got. In fact, they wouldn't have a brick wall at all. The best writers, not only in this country, but in the old country, are writing on this subject.

Mr. Lauer: I want to know about one point. I want to know about that wall. Did not the man want to use stone in his wall? Did he not in the first place want to use natural stone?

Mr. Van Hook: Perhaps he did.

Mr. Lauer: The difference in price between real stone and concrete is considerable, and I think that answers the question why he used concrete. Now if a man can get concrete block for less money than he can real stone, and it looks well, why, he will probably take the concrete. Now, Mr. Van Hook, you sold Mr. Hammerschmidt his machine, did you not? He considers his block a pretty good block. Do you not consider it so?

Mr. Van Hook: Mr. Hammerschmidt's block is better than the average.

Mr. Lauer: You consider his block better than the average, and yet you can pour water right through it.

Mr. Van Hook: I did not know you could pour water through it. Mr. Hammerschmidt is experimenting on his product. I do not know just what he is doing, and it may be he has struck something entirely new.

Mr. Lauer: The block will take water, whether it is made of the same constituents that Mr. Hammerschmidt makes his or not. This is a fact, because I tried it, and whether the composition be stone and cement or sand and cement, you can pour water into it, and it will take it and absorb it, and we know a product, whether it be a clay product or a concrete product, that will take water, as does the concrete block now being manufactured, is not fit for building purposes.

Pres. Butterworth: Gentlemen, this discussion is interesting, but we have other things on the programme to which we must give our attention. The next number of the programme is a paper, Prof. C. W. Rolfe on, "Shall the University Establish a Clay Laboratory; Inaugurate an Investigation of the Clay Resources of Illinois; and Offer a Course in Ceramic Engineering?"

SHALL THE UNIVERSITY ESTABLISH A CLAY LABORATORY, INAUGURATE AN INVESTIGATION OF THE CLAY RESOURCES OF ILLINOIS, AND OFFER A COURSE IN CERAMIC ENGINEERING?

I come before you this afternoon to ask a question and suggest a plan. My question is this—Is there any legitimate way in which the university can help the clayworkers in developing the clay resources of our state? I say help the clayworkers because, for reasons which I shall try to make clear, the university can not and should not be expected to take the initiative in the matter. This must always come from the clayworkers themselves.

The congressional grant upon which the series of state schools to which this university belongs was founded distinctly states that the prime object in establishing these state universities was "to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." It was plainly the intention of its founders that the university should offer such help as its resources would enable it to command to each pursuit and profession of life represented within the state.

Please note that it is the function of the university to promote, which means to encourage or offer aid, and not in any sense to coerce or drive. This was emphasized by the financial conditions under which the university was placed. It was given a small endowment, whose income is barely sufficient to provide it with pin money, but was left entirely dependent on the legislature for the means with which to carry out any proposed line of educational policy. Hence it must look to the people to endorse any educational scheme which it may formulate.

It would obviously have been impolitic for the university to have demanded from the legislature in the beginning the means which would have been absolutely necessary to enable it to offer aid to all pursuits at once, as it would have been impossible for our legislators to have granted such aid if asked; consequently the authorities confined their efforts at first to those lines which called most loudly for aid. At the very outset the engineering interests of the state recognized in the university an instrumentality which could be of large assistance to them and they pressed their claim so vigorously that at once time it seemed as though this was destined to become purely a school for engineers, and they rightly continue to press their claims even now.

Gradually the teachers, the farmers, the lawyers, the physicians, and the commercial interests began to call for help and at each call the university strained its resources almost to the breaking point to meet the demand. In every case also the legislature has approved this expansion, responded heartily to our demands, and provided the means required to carry on the new lines of work.

Up to the present, the clayworkers as a body have made no demands upon the university. Individual requests have often been made and the number of such requests is increasing every year and we try in each case to render such aid as we can, but as no general call has been made no funds have been provided and no adequate means are at our command to meet these calls.

Why have you refrained from asking the help of the university? Is it because you have no unsolved problems in your business? Do you know all that is necessary or desirable to know about the properties of the materials which you use, and the effects which the various mechanical, chemical and thermal agencies which you employ have upon them? Are you thoroughly familiar with the kinds of material suited to your use which are offered by each county or section of our state, and with the properties of each deposit, so that you can at once lay your hand on the material best suited to the product you wish to manufacture, and do you know just how to correct the deficiencies if you fail to find a deposit exactly suited to your need? Or, are the difficulties which beset the clayworker so local in their character that each yard owner must work them out for himself and that the information gained in one place would in no wise help the worker in another locality?

The fact that you have taken the time and put yourselves to the trouble and expense of attending this convention proves that these statements are not true. Each has come here expecting to pick up something from the experiences of others which will help him in his business.

But there is certainly something the matter, something that should be remedied if possible. The clayworkers of Illinois are increasing their output both in value and character of products but they are not keeping pace with their competitors. In 1894 Illinois held second rank in output of clay products. Now it occupies fourth place.

Since 1897 Illinois has increased the value of its annual output by 80 per cent. In the same time New Jersey has made an increase of 100 per cent, Ohio 130 per cent, and Pennsylvania of 150 per cent.

The recent geologic history of Illinois has favored the formation of valuable deposits of kaolin, ball, flint, fire and terra cotta clays, and many samples received by me during recent years prove that we have them, yet although our manufacturers are turning out nearly $2,000,000 worth of the better grades of clay ware each year, I believe I am correct in saying that nearly all the material for the manufacture of these high grade wares is imported from other states. Is not this an excellent example of Chinese financiering?

These difficulties are real and lead us again to wonder why our clayworkers have been so apathetic in the development of our natural resources. There is another possible explanation which is that the general problems which trouble you are of such a character, so different in their nature from those which beset the agriculturist or the engineer, that you do not think their solution can legitimately be undertaken by the university, or what is the same thing, by the state, since the university is merely the agent of the state. Let us see whether this is true or not.

I believe I am correct when I say that the sole object of any form of government is the betterment of the community governed. If this is true then any act or expenditure of a government is legitimate which looks toward the betterment of the community as a whole. No act or expenditure is legitimate which does not benefit the community as a whole. The pleasure, profit, or even necessities of an individual or group of individuals should be taken into account only so far as they relate to the welfare of the whole community. The state has no right in any way to interfere with the liberty of the individual unless such interference is necessary to protect the interests of the commonwealth. The state has no right to grant favors to an individual or group of individuals which do not at the same time benefit the whole community.

I do not think any of you will question these statements, or will doubt the further statement that they form the bill of rights by which all governmental acts must ultimately be judged.

The right of the university to exist, then, rests entirely on its usefulness to the general public. If it is returning value received and more for all that is expended in its maintenance, it is a legitimate and profitable investment of the people's funds, but in proportion as it fails to do this it forfeits its claim for continued support. Whatever argument can be applied to the university as a whole may be applied as well to each department of the university. No department has any claim to the continued support of the university which can not demonstrate its usefulness to the commonwealth and no piece of work should be undertaken by any department unless it can be shown that its accomplishment will result in some general good.

Returning now to our question: Are the problems which confront the clayworkers, or any of them, of such a character that their solution would be a distinct gain to the community in the way of improving the quality, increasing the tastefulness or beauty, or lowering the price of products which the public need, and are they at the same time of such nature that they can be more accurately or economically solved by utilizing the resources of the university than would be the case if each operator undertook their solution for himself? If so, you are justified in asking the university to undertake these tasks for you. Why do you not do it?

It is the business of the university to instruct and to investigate, to train leaders of the people, and directors of large enterprises, by putting them abreast of the world in all that pertains to the particular line of business which they have chosen for their life work, and to use every means which is placed within its reach to find ways in which the needs of the commonwealth may be met and the natural resources of the world be made useful.

In regard to the first of these duties is the university doing all it should do in the way of instruction for the clay industries of Illinois? Are there subjects not now offered which could be profitably added to its curriculum? Could courses be arranged that would better fit our students for usefulness in your lines than any now offered by the university? Is there a real need for such work as is now being undertaken at New Brunswick, N. J.; Alfred, N. Y., or Columbus, O.? Would you be able to improve the quality or lessen the cost of your wares if you had as superintendents of your factories men who, in addition to the practical training which your superintendents now have, were also trained along such scientific and technical lines as might be offered by our schools? If such training would be useful, and you would like to see such courses introduced, why do you not ask for them? The university will grant your request if you ask hard enough.

Whenever a proposition is made that the university shall introduce a new line of instruction or undertake a particular investigation, that position should be supported by facts and arguments to show that the results of such instruction or investigation would probably be beneficial to the general public and also that the investigation is of such a character that it cannot well be undertaken by an individual or private corporation, or that it is of such general nature that it may be carried out once for all by the university.

When a proposition so supported has been made to the authorities of the university it is clearly their duty to provide for carrying it out as speedily as the conditions will permit.

There is another side to these questions which is of great importance from the standpoint of the university. It is a well established fact that in this world we do not often get something for nothing. The addition of new courses means increase of the instructional force and the carrying on of an investigation of any kind means apparatus and materials which must be purchased, and workmen who must be paid for services rendered. All these expenses must be provided for before the trustees would be justified in undertaking the new line of work.

The makers of the constitution of our state realizing that it would be necessary to carry forward these general projects, made provision for levying taxes to meet the expense, and placed the distribution of the funds so raised in the hands of delegates chosen by the people for this purpose.

The revenue of the state is collected from the people. It belongs to the people. No part of it can be legitimately expended except for the general good and the people absolutely control its expenditure through delegates which they select.

The university has not and should not have any representation in this body. It has no voice in the distribution of the revenues of the state. The appropriations made to the university are assigned for specific purposes, and it is the duty of its trustees to administer these various funds conscientiously for the promotion of the objects specified. They have no election in the matter.

Under the terms of the constitution each large business enterprise is effectively represented in the legislature, and can if it chooses, have an influential voice in the distribution of state revenue. If, then, any given interest wishes to enlist the efforts of the university, or any department, in its behalf, it should be the duty of those directly concerned in this industry to see to it that their representatives make such provision as may be necessary to cover the cost of the needed service.

This principle is already recognized and several large business interests are applying it in such a way as to secure provision for their needs. The Live Stock Breeders' Association secured from the last legislature an annual appropriation of $25,000 for experiments in the breeding and feeding of beef cattle, horses, sheep, swine, etc. The Corn Growers' and Corn Breeders' Associations secured one of $10,000 yearly for experiments in the breeding and culture of corn. The Farmers' Institute secured one of $25,000 yearly for the investigation of soils. The Dairymen's Association secured the annual sum of $15,000 to develop improved methods for producing dairy products. The Horticultural Society secured $10,000 yearly for experiments in orchard management. The Society of Engineers, $75,000 annually for investigations along several lines of engineering problems. Note that in each case the money was appropriated for a sharply-defined purpose and can not be used for anything else.

These appropriations were secured from the legislature because associations of persons directly interested in the various industries urged their need upon their representatives in the councils of the state and demonstrated in each case that the asking was for a well-defined purpose which was recognized by all as one whose accomplishment would be helpful to the commonwealth at large.

The Poultry Association and the Sugar Beet Growers' Association each asked for an appropriation of $5,000 yearly, but failing to urge their needs energetically, the askings fell by the wayside.

The clayworkers of the state are paying their full share of these various appropriations, and it is right that they should do so, for each one will be benefited by the outcome of the investigations, but while it is necessary and right that you should help others to make the most of their resources is it not as necessary that you should receive help in developing the natural resources of the state in which you are most directly interested?

The representatives of each industry owe it to the state to so husband and use those natural resources which fall in their line as to make them of the largest possible benefit to the commonwealth. This is not purely, perhaps not mainly, a matter of personal gain to those present. It is your duty as citizens. It is as much your duty to use every effort to advance the industry which you represent, and thereby bring the necessities and comforts of life within easier reach of the masses, as it is to vote at the coming national or state election. In the division of labor it has fallen to your lot to be made responsible for the location of deposits of every kind of clay, or of other materials useful to clayworkers, which can be found within the borders of our state; for making an exhaustive study of the properties of each variety with a view to determining what use may be made of it; for investigating the properties and behavior of clays in general, and of their products, in order that means may be devised by which they may be more easily converted into objects of usefulness and beauty. All these things you should do unselfishly, having in mind the general good rather than individual profit, and you should publish the results to the world. If it should happen, as it certainly will, that in the course of these investigations matters are developed which the wide-awake among you can use to your personal profit, that should be regarded as a fortunate incident in the investigation rather than as an object.

Are you, then, willing to take up the "white's man's burden," and to devote whatever of time, trouble and expense may be necessary to make the general public realize that your motives are at bottom unslfish, and that therefore you are entitled to their help in carrying the projects forward?

The clayworkers of New Jersey, New York, Pennsylvania, Maryland, Ohio, Wisconsin, Missouri, and Georgia have answered similar questions in the affirmative, have secured the necessary appropriations, and investigations of greater or less value are now being made in each of these states. So far as the clay interests of Illinois are concerned, the decision and the result rest with you. If any considerable amount of work in these lines is done, you must assume its general direction and you must secure the funds. There is no one who can do this work for you.

In case you find yourselves sufficiently interested in this matter to take further action I take the liberty to suggest the following plan of procedure, which has been successfully tried elsewhere:

Let an advisory board of five of your most influential and progressive members be appointed and give this board, in conjunction with not more than two representatives from the university, power to decide what lines of investigation shall be undertaken, and the amount of money which should be expended on each.

This, you see, will give you a large influence in directing what new courses of study shall be introduced and what lines of investigation shall be undertaken.

Let your association delegate to this board, or better, to a strong committee raised for that express purpose, such powers as may be necessary to secure the required funds from the legislature.

Let the appropriations be placed under the care of the president and trustees of the university and make them responsible for their judicious expenditure along the lines mapped out by the advisory board.

Prof. C. W. Rolfe: I hope now, gentlemen, that no member of this Association will vote upon this matter until he has considered it thoroughly. I hope that no member of this Association will vote in the affirmative on the proposition contained in this paper, unless he is willing to give it his hearty, cordial support, and give it time, labor and money, if necessary, in order to carry it through, and I hope no man will accept a place on this committee if it be decided to appoint a committee, unless he is willing to give his best energies to it. The work will not be easy, it means hard work to carry this proposition through. Work judiciously expended has accomplished good results for other industries. I do not see why it should not do as much for you. (Applause.)

Mr. Purington: Mr. President, there have been few papers read before any convention of clayworkers where I have been present that have come nearer the mapping out of work that I believe necessary to be done than that just read by Prof. Rolfe. There are many of you here who remember the early days and the hard work that many of us did to secure an appropriation from the state of Ohio for a ceramic school in that state. And there are many of you who know what the result has been of that work. In order to secure the appropriation, the National Association of Brick Manufacturers have paid for one scholarship every year since that school was started. In the recent message of the Governor of this state he says that the value of the clay products of this state are ten million dollars. This, he says, is from the latest statistics. I did a little figuring in the presence of one or two members of this convention, and taking the common brick products of Chicago, we figured up five and a half million dollars alone. I haven't a bit of doubt but what the clay products of the state of Illinois during 1904 were a good deal nearer twenty million than ten million dollars, and that was due to the lack of knowledge and lack of willingness and lack of education which leads the clayworkers to fail to realize the necessity of these statistics. That is about the only real statistical information that we get now. It is from the census department. I know a great many of you who get the communications from the Government and look over these questions and say "That is giving away my business," and they don't answer that, and the Government doesn't find out what it wants to know, and it assumes that that is the full and only information and publishes it broadcast as such.

I am very much interested in the object set forth in Professor Rolfe's statement, and in pursuance of that I want to read a resolution covering this ground:

AN ACT TO EXTEND THE EQUIPMENT AND INCREASE THE INSTRUCTION IN THE COLLEGE OF SCIENCE OF THE UNIVERSITY OF ILLINOIS, AND TO MAKE PROVISION FOR INVESTIGATIONS THEREBY.

Whereas—The prosperity of a state depends largely upon the opportunities for profitable employment open to its citizens;

Whereas—There is no way in which these opportunities can be multiplied more certainly or more cheaply than by the development of its natural resources;

Whereas—In view of the rapid decrease in our supply of timber, clay and other rock products are destined to largely replace wood for structural purposes;

Whereas—Since the annual output of clay products in Illinois has already reached ten millions of dollars, is growing rapidly, and will grow still more rapidly, it is desirable that their manufacture should be directed by men who have been thoroughly trained in all subjects which will give them a better understanding of the origin and properties of clays to the end that the general public may have the best of building material;

Whereas—It is desirable that the State of Illinois should so far as possible supply all material for its manufacture;

Whereas—The clay resources of our state have never been investigated while our neighboring states have conducted such investigations;

Whereas—The little that is known of our clay resources indicates that many valuable deposits of the better grades of clay now lie entirely undeveloped;

Whereas—Most of the more valuable clays now manufactured in Illinois are imported from other states which are not better provided by nature than our own;

Whereas—There are in the instructional force of the University of Illinois those who are competent to direct this teaching and these investigations, and the laboratories of the University already contain much of the apparatus necessary to carry them forward; therefore be it

Resolved—That the Illinois Clayworkers' Association hereby earnestly requests the Legislature to make such appropriations to the College of Science of the University of Illinois as will enable it to make such additions to its teaching force and equipment as are necessary for thorough and practical instruction in the geology of clay deposits, their origin, classification, physical and chemical properties and their behavior under such influences and conditions as are met with during process of manufacture. They also request that additional appropriation be made to enable said College of Science to inaugurate and prosecute with vigor a thorough investigation of the clay resources of Illinois, including the location of valuable deposits and a study of the properties of each; to make such general investigations of clay working materials, and such collections of materials and products as may be of interest to clayworkers at large; and to publish the results of these investigations in such manner as will make them available to all interested persons.

Resolved—That the clayworkers of Illinois earnestly request all taxpayers connected with agricultural and engineering operations, railroads, building trades, or the manufacture, sale or use of structural materials, to join us in this petition to the General Assembly.

Be it enacted by the People of the State of Illinois represented in the General Assembly:

Section 1. That it shall be the duty of the College of Science of the University of Illinois to give thorough, reliable, and practical instruction in the geology of clay working materials, their origin, classification, physical and chemical properties, and their behavior under such influences as are met with in processes of manufacture, and to provide for this purpose such instructors, laboratories, apparatus and illustrative material as may be necessary to make this instruction practical.

That to carry out the provisions of this section there is hereby appropriated the sum of fifteen thousand dollars annually for the years 1905 and 1906.

Sec. 2. That it shall be the duty of the College of Science of the University of Illinois to inaugurate and prosecute vigorously an investigation of the clay resources of the state, including the location of all valuable deposits, and an exhaustive study of the properties of each; to prosecute such investigations of general clay working problems as may be of interest to clay workers at large; and to publish the results of these investigations in such form that they will be available to all interested. That to carry out the provisions of this section there is hereby appropriated the sum of twenty thousand dollars annually for the years 1905 and 1906; *Provided*, that the work undertaken and outlined in this section shall be carried out on lines to be agreed upon by an advisory committee of seven, five of whom shall be selected by the Clay Workers' Association and two appointed by the University. One of those appointed by the University shall be chairman.

Sec. 3. The Advisory Committee shall meet annually at the College of Science at such time as may be designated by the chairman, and shall serve without compensation except for expenses, which shall be paid out of the funds provided above, and said committee shall report to the Association at its annual meeting all work in progress and all results reached during the year. It is understood that the functions of this committee are advisory. They are to plan the work, but its execution and the control of the expenditure of all moneys appropriated in this act belong to the Board of Trustees of the University of Illinois for the purposes indicated in this Act, and they shall account therefor.

Sec. 4. No part of the funds appropriated in Section 2 shall be used for purposes of instruction.

Sec. 5. The Auditor of Public Accounts is hereby authorized to draw his warrants on the State Treasurer for the sums herein indicated appropriated in semi-annual installments upon the order of the Chairman of the Board of Trustees of the University of Illinois countersigned by its Secretary, and with the corporate seal of the University, and no installment subsequent to the first shall be paid by the Treasurer, nor warrant drawn therefor, until detailed statements showing the expenditure of the preceding installment have been filed with the Auditor of Public Accounts.

Now, Mr. Chairman, I move the adoption of this resolution, and I agree with what Professor Rolfe has said. I want no man to vote in the affirmative unless he is willing to do everything he can to carry to a successful culmination the object that we have started out to accomplish. I believe it is possible to carry this thing through if every man will put his shoulder to the wheel and co-operate heartily with the committee that is appointed.

When the President said that it was moved and seconded the resolution be adopted, and asked if they were ready for the question, Mr. Blair said that he regretted very much for the time being that he was not a citizen of Illinois, and Mr. Cowgill added, "I do, too." Mr. Blair further said:

"But if this resolution were to be offered in a convention in my own state, I don't know if there could be one offered that I would vote for with more satisfaction and more comfort and more pride than I would vote for the resolution just offered, and I do certainly hope that the resolution will be followed after its adoption by a persistent and determined effort to carry out its spirit and its letter."

Mr. Purington: I don't want to offer any financial inducement to anybody to vote for this, but I want it understood distinctly that if this resolution passes, there is going to be necessary a certain amount of ready funds for this committee to use to carry out the purposes outlined in that resolution, and the only thing that I ask in connection with this is that I may head that subscription list with $100, to give the thing a start. (Applause.)

Mr. Blair: There is just one suggestion that I want to make to the resolution: after the words "Behavior in its manufacture," the words "And its uses" be inserted. It will please me very much.

Mr. Stipes: Put me down as the second $100.

The President: Gentlemen, you can put your president down for the third $100.

Mr. Purington: In connection with what Mr. Blair says, perhaps we had better leave this in this way: That while this is a hastily drawn resolution, and there may be quite a number of phrases that want changing, it will be understood that any changes that that committee desire to make hereafter may be made in the form of that resolution.

The President: Do I understand that your motion calls for the appointment of a committee?

Mr. Purington: No, sir; it does not. My motion is for the adoption of this resolution.

The President: Gentlemen, the question before the house is whether or not this resolution shall be adopted, not precisely as read, but subject to any minor change which the committee may see fit to make. The Indiana people have a vote on this the same as the Illinois people.

Everybody arose, and the resolution was carried unanimously. Even a bull dog that was in the room barked.

Mr. C. C. Barr: Mr. President and gentlemen—

Resolved—That the President of the Illinois Clay Workers' Association, Frank Butterworth of Danville, as chairman, and five additional members of the Association, to be appointed by him, shall be a committee to render such assistance as it may be able to secure the passage of a joint resolution by the Legislature of Illinois, providing for an appropriation of $35,000 to carry out and put with effect the resolution introduced by Mr. D. V. Purington, and

Resolved, further—That this committee shall use its best efforts to secure the passage by the Legislature of Illinois of the proposed legislation, and for this purpose shall be authorized to collect subscriptions from members and others to defray necessary expenses of securing such legislation.

Mr. Purington: I second the motion. I think Mr. Barr had better put that motion himself, inasmuch as the Chairman is included.

The motion was carried unanimously by a rising vote.

Mr. R. M. Combs of Chicago then read his paper, the "Evolution of the Face Brick."

"EVOLUTION OF THE FACE BRICK."

When requested to address this convention at the recognized center of learning of the State of Illinois, on the subject, "Evolution of the Face Brick," I naturally referred to Darwin's works for pointers on this great theory. Think, gentlemen, of the thousands of years and thousands of stages that must have been passed through, since your ancestors, the apes, threw mud balls at each other along the pre-historic rivers, to reach the high development of modern achievement as represented by this assembled convention.

The evolutionary process is still traceable. Are we not still making mud balls and still throwing them at each other? Whether these were dry-pressed, stiff-mud, soft-mud, side-cut, end-cut or sand-lime, Mr. Darwin neglected to state. How many millions of years must have elapsed to have developed our successful presiding officer, who is still making mud balls on the bank of the Vermillion, as his four-legged forefathers did along the banks of the Nile and the banks of the Wabash?

Now that I have this opportunity to talk to you, gentlemen, the crafty "dry-press" and "stiff-mud" sons of toil, who deliver the goods promptly——at times, I will give you a brief description of the brick market of the middle West, what the demands were, what they are, what I think they will be and why.

Conditions up to ten years ago were about the same as when Captain John Smith landed on Pochahontas with a Philadelphia red brick. The demand was for an even shading of brick in different colors and tints with which we were invariably required to furnish moulded and ornamental brick to match in color and size. The repeated failure to exactly match all requirements helped to bring about the conditions that we have to-day and helped the brick maker to ward off, for a time at least, the bald head period of life. In those trying days, I have had architects bring to our office water color sketches and samples of woven wall fabrics for us to match with brick. Of course, we did it (or at least promised to). Then we would send to the factory a sample of the color in question and impress upon the manufacturer the importance of matching this accidental tint of the artist or dyer. Then, strange as it may seem to you, gentlemen, the delivery of brick in every case would be exactly——what the maker felt like shipping—but of an even run in color so even that when laid up after careful gauging they would look like painted walls. "Beautiful!" said the average owner. "Fair!" would say the architect. "Rank!" would invariably be my opinion, never voiced, however, as one in my capacity is not permitted to criticise. We had been brought up to believe that a pressed brick front must necessarily be one of strictly even run in color. We had in mind the precedent established back in colonial days by the builders who put up wooden houses and painted them in imitation of the high priced brick and stone which were at that time imported. Many examples of these buildings still stand in the old cities of the East.

Today, however, we find the conditions changed. The same agent, *paint*, has helped to bring it about. Painters, for a sum much less than the cost of a pressed brick front, began transforming common brick walls into beautiful, even-shaded, alleged pressed brick works of art. They became so expert in this, that by the addition of a little sand on their paint they actually deceived some people into buying their work as pressed brick buildings. This fact was brought to my attention by the purchaser of one, who came to get enough brick to build some porch piers with. He wanted them to match his bogus brick. I was sorry not to have been able to make the sale, but my conscience balked at counterfeits.

The painter might have driven the face brick man out of business, had he not proved so energetic in his greed for coin. He saw that paint would take well on brick, and with it began to tell all who looked at the side of an attractive building, the brand of "beer that made Milwaukee famous" or "of the wonderful nourishment in shredded shoe pegs" as a breakfast food—— This sort of thing badly jars the nerves of the aesthetic architect or owner, and even the commercial brick salesman.

At a convention of the Architectural League of America, upon one occasion, I was pleased to hear one of Chicago's most famous architects, a man who is a recognized authority on many subjects, advise his fellows not to disguise building material. He said, "Do not masquerade iron as wood nor paint as brick. In your rendering emulate nature which shows no perfectly straight lines of even colors." Such advice has helped to bring about the demand we have for varied shaded brick. There is still, however, a certain call for brick of an even run of color. The demand is that they must be impervious.

The use of evenly shaded brick in certain designs of architecture will always exist. Some manufacturers are supplying such calls with thoroughly vitrified brick in the colors and shading demanded. These are readily distinguished in texture and finish from the old-fashioned dry-press brick that spasmodically tire of their own appearance and break forth in great blotches of ghastly white or bilious green discoloration. This fact has been one of the greatest forces that has led the architect and student of art to seek amongst the manufacturers for a vitrified brick that would always remain the same.

Not long ago, I was requested to go out of town to look at a building upon which two stories were to be added. The architect stated that it had originally been built of gray brick, and instructed me to take several samples and match it as closely as possible. When I arrived at my destination, I was surprised to have the owner tell me that he never possessed a gray brick building. He pointed out the one in question, which at first glance looked a dirty gray, but upon investigation I found it to be a dry-pressed, red brick, entirely covered with white efflorescence. So completely was it covered that it misled the architect. He thought it such a good joke on himself that he promptly specified my brand of red dry-press-brick, which was guaranteed to turn out just as badly in color as the original brick. Such things as this, I believe, called for the many papers and discussions as to a preventative for the alkali evil. These, no doubt, have stimulated the experiments in stiff-mud burning, that have given us a magnificent assortment of vitrified bricks, that look as well in the wall after years of weather, as when first laid up. This fact alone has advanced their use in many buildings where stone fronts were contemplated.

The money lenders, who back up the speculative builders, know that a building will revert to them in good condition if impervious bricks are used. So, when specifications call for this class of material, the loan comes more easily and in larger proportions. The architect who has studied in Europe is as a rule the champion of vitrified and variously shaded brick. He has in mind the stately old land-marks of foreign countries standing today, because they were built of vitrified material. Time has not changed these buildings. They look soft and mellow and seem to have taken on a rich everlasting tone, which upon careful investigation is found to be produced by many shades of brick that blend in beautiful harmony.

The architect who is a student of nature is another advocate of vitrified brick varying in shade. His aim is to erect a building that looks at home with its surroundings. If in the country, he wants the walls to blend with the bark on the trees. His aim is to produce a house that looks as tho' it had found a good comfortable spot and had decided to squat there for all time. Such a man studies the harmony of his face brick, as he does the oriental rugs he furnishes his house with. He usually selects a rough paving brick and thinks the rougher they are the better.

What I have just said refers particularly to carefully studied designs for country and suburban buildings. I find the same reason exists for using this class of brick in typical city buildings and manufacturing plants. Consequently, we find the demand at the present time is largely for face brick that are vitrified, and as a rule for those that vary in shade and texture.

The enameled brick, a class that I have not yet referred to, seems to have a bright and favorable future. Our home manufacturers have developed their product so materially during the last decade that we have bricks dependable in quality, attractive in color and sizes, which can be delivered very reasonably in price compared with the imported article. So we find architects using them for entire fronts, as well as for lining light courts and so on. Experience has taught these manufacturers, however, that a stiff-mud backing for their enamel is the proper thing. Hence, in this branch of industry we see the vitrified principle asserting itself. The experimental stage, however, in making brick of this character, is so protracted and costly that few who attempt it, survive that period, as is evidenced by the fact that many who have started have failed totally in their effort. As the modern method of construction permits the use of various weights of brick, we find nearly all of the recently erected sky-scrapers faced with heavy vitrified materials, which at one time were thought impossible to use at such great heights. In such buildings as these, whether large or small, we find "The Evolution of the Face Brick" has been from a red evenly shaded absorbent brick, to a hard burned non-absorbent brick.

I understand, gentlemen, that it is customary to question the author of a paper, in order to bring out something that he may have overlooked. I shall explain my position in such a case by telling of an Irishman who was elaborately dressed up to marshal a St. Patrick's day parade. He wore a fine old silk hat with a broad green band, and across his chest was a wide green sash. In his button hole a bunch of shamrocks that would make the Blarney stone grow moss with envy. By noontime he was swelled with drink and very hungry, so he enters a restaurant with stately grace and pride, with colors flying. The place was crowded and the only vacant seat was opposite a man who wore across his breast a sash of orange silk. This caught his eye like a flash and as he sat down he glared defiance across the table. The waiter came to take the orders. He turned first to the orange man, who in a loud voice ordered a lemon pie, a bunch of bananas and an orange. The waiter, turning to our green hero, was surprised to hear him say in slow measured tones, with his eye on the man opposite, "I—would — like — a — cup — of — green — tea — a — head — of lettuce—and—a—dill—pickle." "Is there anything else you would like?" asked the waiter. "Yes," said he, spitting upon his fist, "I would like some one to say something." So now, gentlemen, some one may say something.

The story with which he wound up his paper was greeted with continued laughter.

THE PRESIDENT: Nobody seems to have anything to say except the dog.

In the absence of Mr. H. C. Morrow, who was to read a paper on "A Modern Clay Manufacturing Plant," Mr. G. E. Luce, constructing engineer of the Illinois Brick Company, Chicago, read his paper.

A MODERN CLAY MANUFACTURING PLANT.

The subject before us, the economical construction of a brick plant, is one of great differences of opinion and one on which the writer feels his inability to deal with, especially considering the audience.

We are all no doubt familiar with this subject, having talked the matter over extensively before building your several plants: and no doubt some have talked it over since—some wish the matter had been more extensively discussed before building.

The question as I see it has several important features, namely: first—cost of construction, cost of maintenance, but no doubt the items of cost of production after the plant is built overshadows them all. However, the first cost is an item to be considered, for this cost represents the investment and is that amount on which the stockholders expect a dividend, or at least, not an assessment; but on the first cost too much stress should not be laid, for ofttimes plants are built too cheaply or poorly and no dividends are paid because the costs of maintenance are too high compared to production or results. Maintenance with soft brick are to-day the brick-makers' greatest troubles and both should be carefully avoided if possible.

Some engineers in figuring cost of construction base their calculation on formula of $1,000 per 1,000 brick capacity: this in my judgment is low in some cases and high in others. Building brick plants of large capacity do not cost this, some small ones do; from this we would conclude the large capacity plants—economy, as they are provided we have market for the output.

Without a heavy expediture for maintenance on the poorly constructed plant, depreciation takes place, which in a few years gives us considerable worry. Ofttimes this item is not taken into account as it should be and too large dividends are paid compared with actual depreciation, which sooner or later means assessments, or going out of business on account of close competition. Then would it not be economy to build with a view of having as little depreciation as possible?

At the end of each month our bookeeper must strike a trial balance and if he is a few cents out must worry night and day until it's found. Do we call on our managers or presidents for balance sheet of what should have been the results? No. And why? Should he not be able with his knowledge and vast amount of knowledge he secured from the various machines, dryer-kiln and engineers, they ofttime can give exact figures as to costs of production, figuring to a man the number it will take to produce a given amount of brick. Why can't he do this? The maintenance item he could not figure; perhaps the machine man could. This item is always in his mind; it's his salvation (repairs). Cost of production as I have said overshadows all—is our dividends—good feeling, and if low enough, is the smile that won't come off.

The low enough means as low as our competitor, for he is to be considered in all our confidences, and rightly so, too. How will the life of my plant compare with his, which could hold out in case of war, as will sometime happen; would his depreciation be greater than mine, or less, allowing our cost of production to be the same?

This item of cost of production is likely the greatest with every one, even overshadowing quality in many cases; and should it not foresee the sand lime brick, cement brick, blocks and the various patent medicines on the market to-day? Don't people buy them? Yes. Are they not our competition? Not saying they are the best nor admitting even that they are as good, but finally believing we were here first and hoping to stay the longest.

Not only is the cost of maintenance heavy on the poorly constructed plant, but time is lost in making changes and repairs—time is money. After considerable time the owner finds he needs a new plant in order to meet the market.

A few years ago when we had decided to construct the plant, a site was selected and without much ceremony we decided the way to build it—by some plant we have seen—contemplating some changes from our neighbor's, which would be watched when that stage of construction was reached. We drove a stake down in the field and started. Here was our kiln ground, there dryer or sheds, here engine and boiler room, and the plant was started. Not thinking we would want a railroad track, but found later we did, so trouble was experienced in getting into our location and changes had to be made, costing money. Again, our engine was too small and we had to enlarge, building to accommodate it, costing money; aside from cost of engine again we made brick but found our boiler capacity too small and had to install another boiler. Thus more cost; in this we are not considering any changes or additions to dryer or kilns that have failed to meet the expectations of the man who sold them to us. As a matter of course, considering various additions and changes, in a few years we have a large investment on small output.

But we can argue that this way—and in many cases it fits: We did not have the money to build as we would; if we had had more capital; but how many large concerns do we find pursuing the same course, claiming will the trade justify it. Has there ever been a time when there was no market for brick, if anything else had a market? Having said enough along this line I will hasten on with the subject before us, economy.

Economy in the construction of a brick plant should be looked at in only two ways, namely: economy in cost of production and economy of maintenance. How many thousand brick can you make per day and what will they cost you per thousand to load them on the cars, and in producing so many brick how much will it cost you to keep up your equipage so that at the end of any term of years your plant will be equal to or better than when you started—if not equal, what will the depreciation be?

It is not the intention of the writer to give any figures or cost of construction or production, to advocate any kind of dryer, machinery or equipage, but to deal in generalities in the construction of a brick plant. our first step in brick-making is getting the clay from the field. As a matter of economy a good heavy hoist with large drum is perhaps the best adapted for this work, although electricity is being successfully used in some large plants. The incline, if there be one, should be built with a view of allowing the empty car to return by gravity, and by a little engineering this can be carried considerable distance, saving labor and ofttimes an extra power of horse or engine.

Cars as large as possible should be used, they reducing the amount of trips necessary and deliver more clay for the least wear on both hoist and cars, giving the man at hoist more time in which to do his work, as he is ofttimes rushed, causing wrecks.

Our next step in brick-making is putting the clay through the various machinery and on this subject I would say the heaviest made (machinery men seldom get too much iron into their machinery); also the most simple, keeping in view at all times the very important principle of maintenance—that is, every box and pulley should be free so the same can be quickly repaired and duplicate parts are essential. Our machines should be set on a solid foundation of masonry and substantially bolted down so that all working parts could be kept in perfect line. No platforms should be attached to building; our line shaft should be set on solid masonry, securely bolted down; no wood should be used under our machinery or line shafting, as it soon rots or shrinks and gets loose, although some engineers claim wood makes a good cushion I doubt the need of cushions for brick machinery. Referring again to our line shafting this is something that gives trouble, and why? Generally there is not enough weight in piers to counterbalance pull of engine. How often do we see line shafting set on small piers or bents of wood and, when compared to size of engine foundation, stand in about ratio of 1 to 20, and we wonder how they get out of line. Always get heavy line shafting and key pulleys; it pays.

From the machine room our brick passes into dryer. At this point, considering we are modern brick makers and have artificial heat dryers, cast cars, awful beamy, with wood pallits transfer cars, turn-tables and miles of steam pipe; if possible avoid turn-tables, as they generally can be with care. The transfer car has enough trouble, especially if track is built on wood ties and the ends of rails in dryer set on timbers. Set the transfer rails on solid masonry, cementing between transfer rails and to top of outside rails and within an inch of inside, setting ends of rails in dryer on solid masonry walls. This in a short time will pay for all trouble in wrecked car, aside from those broken by unevenness of transfer car and rails, and wastage of the goods by wrecks and discouragement of men. Again wood ties in dryer: in fact any ties retard the flow of air where fans are used as part of dryer equipage; in fact they are a detriment to any dryer in this respect. The walls, ceilings and floor should be as smooth and symmetrical as possible; discard all the troublesome items you can.

KIND OF DRYERS.

Much has been said and written, as well as money spent along this line, I am sorry to say with more or less success. If one could have all the different experiences summed up, this one conclusion would be general heat and plenty of it, circulation and more of it. In detail of construction perhaps no two would agree, except that the buildings should be fireproof. It is not the writer's intention to discuss any particular process, but as waste heat has the air of economy, we will consider the building of hot air dryer according to some of the uses in practice to-day. The building should be built on brick or concrete foundation; concrete foundation preferred, for with concrete a better setting of rails can be arranged, as no wooden ties should be used. Heat soon loosening the spikes, allowing rails to spread and wrecks in dryer are costly from every point of view. A cement roof properly constructed is likely the cheapest from several points of view, namely: fireproof, not requiring any pitch, saving in height of building, and last but not least, makes a tight ceiling, causing less leakage of heat, and in most cases heat is money. Again in construction of tunnels they no doubt give better results if made with as little space around car as possible, both on side and top. Air travels where least resistance is offered, and when considered rightly there is plenty of opening through brick and under cars for ample circulation. Then all space must be heated. In ventilation, space to be heated is the important factor along with openings. Regarding stacks or fan exhaust, while the writer favors individual stacks for each two cars for some wares, it is a question of their adaptability for heavy tonnage dryer, but using the prevailing system of having a stack or discharge fan, I would say one stack for a dryer with separate compartments for each track, building the stack only high enough to overcome currents created by roofs of buildings. Should this not be high enough to discharge the steam; the fan is not creating enough pressure and should be run faster or be larger. Two separate fans and engines to run, operate and maintain cost money, and cannot be economy if one would do the work. Again tight fitting dampers with proper adjustments should be provided both at intake and in stacks so they can be adjusted to suit changes of weather conditions, also changes in heat conditions, as well as different kind of clays; over receiving and discharge ends of dryers steel construction with cement roof is preferable, reducing chance of fire, and especially would I advocate plenty of room on these ends.

There is quite a difference of opinion as to length of tracks inside of doors, but as a matter of economy as long as possible to get the results; generally there is a difference of 100° of heat in the length of dryer; this according to some authorities should be divided at about 5° to each car. According to this we would get 20 car lengths or practically 135 feet length when this can be used. It is a matter of economy, for more brick is exposed to same heat. On the same idea there is more heating surface in an 18 foot boiler than in a 16′ 0″ boiler, therefore more evaporation takes place, creating more steam. Again next the stack end it is good practice to pitch the roof; this relieves the steam over the wet cars, allowing it to pass over the cars; at the same time serves as a brace to stacks. Doors to dryer are a very important feature and one to which considerable thought should be given; the usual raising door has its advantages when rightly constructed, but it should be built with a view of opening upward or swinging upward should the cars get away in dryer, as they ofttimes do—the doors should especially be made tight—according to some ideas a batter on the wall of say 1 foot in height of dryer proper makes the door lay snug against the wall by its own weight. Tightness of door is very essential as a matter of economy in operation.

I do not wish to tire you any more along this line, but will leave the matter to your own consideration and the dryer man, who has the only dryer, because according to his testimonial letters he has the best on earth. He will not guarantee to dry any specific amount of brick for any specific amount of money, but will make a contract with you, using his printed blank, containing among other things this clause (provided the clay will stand the heat).

BOILER ROOM.

In this building and its equipage but little attention has been paid by the average brick maker; only the abstract proposition has appealed to him—meager buildings of inflammable material—the setting and general arrangements being on the order of temporary construction, viewed from amount of exposed pipes leading every way.

The boiler room should be as good as any other building if not the best; should be fireproof, conveniently located to the engine room, so the engineer can have direct charge at all times, handy to switch for coal, be large and especially light and airy. In matter of equipage, high pressure boilers of sufficient capacity, at least a surplus above requirements. A very commendable part of the equipment is a good brick stack, but how many good brick makers do we find condemning his brother brick maker for using cement or stone in his construction around the plant, when he at the same time uses an iron stack that only lasts a few years, requiring painting each year and when rusted out he buys another. Again by a very simple arrangement the heat after passing through the boilers can be used for drying the brick (considering we have no waste heat from kilns), whereby saving in cost of drying, as well as effecting a saving on fuel for steam on account of induced draft by fan. This I say is a commendable arrangement when common second kiln are used and where the product can be dried by this kind of heat. Another important and saving appliance in the equipage is one of the improved stokers on the market to-day; they not only make life worth living for the fireman, but are money savers to the company. Again in the construction of the boiler room an ample ventilator (built so it will not leak) should provide for escaping steam. How often do we find no provision made for this and just at the time when something has happened that requires a shut-down of the engine for a few minutes, the safety valves let go and the buildings are full of steam.

I would mention another thing: the heating of water with exhaust steam or waste heat. As a matter of economy, however, we will not dwell along this line, but consider the best buildings and equipages along with well paved floors—will save us money and be considered economy in construction.

ENGINE ROOM AND EQUIPAGE.

On this matter books and catalogues have been published, but the subject needs careful consideration by our craft. Our buildings should be plenty large enough for at least a larger engine than we contemplate. How many do change engines in a short time: others do not, but wish they could. Referring to the room itself, I would say fireproof as possible, paved or cement floor as near dust-proof as possible, include the driving pulley on line shaft within the engine room if possible. Plenty of light and ventilation. In matter of engine, money will be saved by installing Corliss of some standard make, well set, and, above all, large enough for the work. While in choice of an engine the Corliss may save only a few cents per hour or day, brick at times only sell for a few cents per thousand profit and all these savings should be considered. Think carefully of the engine room, its location and equipage before installation, for you may have occasion to think of it later. Another thing, look after the care of oil and its storage; also waste; much waste is wasted and oil carelessly used; at other times not enough used. Would recommend separate building for this, near machine and engine room, absolutely fireproof, where all oils and waste can be kept under the charge of a proper man, who should make record of results for comparison. With this arrangement, fire in some cases could be avoided and economy practiced. By some, rope transmission of power is considered good practice, which if carefully investigated will demonstrate its efficiency to you as a saving as compared to large belts, both in first cost and also in maintenance.

KILNS AND EQUIPMENT.

Passing on to the other parts of our plant brings us to kilns and their equipment. On this subject much could be written or said. In the matter of down draft we find all kinds of ideas and schemes: again we find all kinds of construction and all kinds of results; in different yards we find them using different amounts of coal; some building brick plants running 35 M brick with 3 tons of coal; others using ½ ton per thousand brick; on paving brick plants the same differences exist. Again on some building brick plants 35 per cent are soft brick, others five per cent, and the same exists on paving brick plants. But there is one pleasant feature about this: generally they all think they have the best or as good as the other. With some the round down draft is the only kiln; with others the square kiln is the only way. Leaving the especial design to the owners, all will agree on this proposition. In point of construction our kilns do not last as they should and we ofttimes do not pay enough attention as to how we are going to repair them, for they will surely need repairs. We ofttimes see two kilns side by side built at the same time, one in good repair, the other needing a new kiln to replace it. Again this kiln gives us so much better results with the same fuel than its neighbor. Why? The details of construction were not carried out or there would not have been the difference.

In the second kiln or permanent clamp kiln we find the same trouble; perhaps not quite so pronounced, yet along the same line. The economic construction along this line after thorough decision of requirement, would be the very best of its kind, using good grade of hard burned brick, not bats—sell them to the other fellow—best fire-brick obtainable, and as little mortar or fire clay as can be used and thoroughly bed the brick. Notice some old scoving, how well it lasts without any mortar at all and how short the life of some clamp walls laid up with our brick yard hands. Seemingly what they lacked in judgment they filled with mortar. One thing that has often appealed to the writer: in down draft kilns is loss of heat by deflection from the arch. Note shape of usual arches, see where points of deflection would strike and see in what part of kiln you are getting soft brick. Again consider there are about 1,500 different styles of bottoms for round and square kilns. Surely all are not the best and do not give us the best results. Economy in kiln construction by building the very best, of the best material, with best workmen would be economy beginning at home.

Pertaining to kiln sheds, to those of us who use them a word will suffice. Its questionable the difference between steel and wood construction, and at this time the writer would favor wood construction of some approved plan, using heavy timbers for posts, set well away from kiln. Hard wood timber for rafters, although some companies are building steel sheds with good results. Yet the item of paint and warpage from heat make their use considering first cost a question of economy. Again these same people who are using steel construction in their sheds are using concrete stack and with the concrete stack from the brick maker in mind, we must question their judgment; not condemning concrete, for there are plenty of places it can and should be used. In foundations the brick maker has no especial claim, for brick has not been used extensively in this capacity for only a few years. Again cement makes the very best roof for our plants and measured over a period of ten years is the cheapest. Certainly no brick maker would built a plant on any location expecting to operate it 10 years, for some plants do not begin to pay a dividend before that time.

In conclusion of the economical construction of a brick plant. Our machine man very graciously tells us on signing of an order for his machinery, he will make us complete drawings of plant which will be of great assistance. (True.) He makes us ground plan and perhaps some elevations; his draughtsmen will go into the details if we tell him what we want, but when receiving his blue prints of ground plant and elevations, we decide they are all needed and we start. This is our first mistake. If the placing of the order for machinery did not contain any. The details of construction and machinery including every piece, are the essential things. True, the ground plan is good in its way, but it takes us only far enough to lead to trouble. The brick maker should have his plans perfect in every detail; having gone over the entire matter, making detailed plans of each and every part of the work, and also of the machinery, its setting and its maintenance. Especially would I call attention to the buildings. Note the rate of dividends paid by the different companies; see how much insurance would cost; figure the difference, calculating what a fire would cost you in trade by a shut down for 60 or 90 days. Note that one of the causes (beyond our control) could be scratched from our letter heads and (aside from a wanted fire) we should build better buildings. Then again in the matter of machinery, the best is none too good; it is made to make money for the manufacturer, has weak points and should be carefully gone over, frames strengthened, two bolts where one now holds, true bearings, heavy shafting, use steel cast iron brakes; use considerable of your own judgment and strengthen to suit your requirements. True, the agent says it is built right, but they are often mistaken and they do not run right. All of our equipage should be carefully considered and we should use our very best judgment on all these details.

I say all these things should be marked out in detail before anything is done towards the plant or any of its equipages. This gives you time to change without tearing down any walls or changing any contracts, and is also quite a lesson to the beginner at least, and is ofttimes money well spent to the old manufacturer.

Gentlemen of the Association, I thank you for your attention to things you have already known. Hoping you will have a prosperous year, both in health and dividends, I am,

Prof. Rolfe then extended again a cordial invitation to every member of the association to visit the University, and drew attention to the leaflet containing a diagram of the University buildings, that had been distributed.

The president then announced that the next number on the program was "Joint Fillers for Brick Pavements," by Prof. I. O. Baker of the University of Illinois.

JOINT FILLERS FOR BRICK PAVEMENTS.

Illinois was a pioneer in the introduction of brick pavements. Although not first in the use of brick for paving purposes, she was first in introducing the present form of brick pavement; but it is at least doubtful whether the practice in the Empire State of the West has kept pace with the best methods of other states in the form of joint fillers employed.

Possibly some may think that the method employed or the method used in filling the joints between the bricks of a pavement are unimportant details; but even a superficial comparison between pavements with different joint fillers will show a marked difference in both durability and noiselessness. The writer believes that the common method of constructing brick pavements in Illinois can be greatly improved at comparatively little expense. To show how this may be done, let us consider each of the three or four materials used for filling the joints of a brick pavement.

SAND FILLER.

Fine sand was the first filler employed for brick pavements, and in Illinois is even yet almost exclusively used. A few cities specify that the sand shall be heated to insure that it is perfectly dry; but ordinarily sand as it comes from the bank is strewn over the pavement, and is left to be worked in by traffic. Theoretically this is not as good as sweeping it in, since all of the joints may not get entirely filled, and since further the joints are thus partially filled with manure and street dirt; but the objections are not serious, and the ordinary result is about all that can be expected with sand filler.

The advantages of a sand filler are: 1. It is cheap, usually costing only about 3 cents per square yard. 2. The pavement may be thrown open to traffic as soon as the bricks are laid. 3. The pavement may be taken up easily and without breakage of the brick. 4. It is practically water tight, particularly after being in service a short time. Whenever a brick pavement having a sand filler is opened, the sides of the brick are always found dry and clean a little distance below the wearing surface, which shows that the water does not penetrate to any considerable depth.

The disadvantages of a sand filled are: 1. The sand is easily removed from the top of the joint by the street sweeper,—either the brush broom or the pneumatic cleaner. 2. The sand is likely to be washed out on steep slopes. 3. The most important objection is that the sand does not protect the edges of the brick from chipping. The chipping at first is due to the action of the calks of the horses' shoes; but later after the surface consists of a series of ridges and hollows, the impact of the wheels as they go bumping along over the bricks must greatly hasten the destruction of the pavement.

The conclusion then is that the sand filler is reasonably satisfactory in all respects except that it does not add anything to the life of the pavement, or rather that it permits the pavement to be needlessly destroyed.

TAR FILLER.

The tar in the market is ordinarily that produced by the distillation of coal, and is usually a bi-product in the manufacture of illuminating gas. Tar is a very complex hydro-carbon, and its character varies considerably with the system of manufacture. It naturally contains volatile oils and water; and when re-distilled produces what is designated as distillate No. 1, 2, 3, 4, 5, or 6, according to its hardness. No. 6 is the grade ordinarily used for filling the joints of brick pavements. It varies in price from 6 to 10 cents a gallon, according to the locality and the demand. To apply a tar filler, the bricks should be dry, and the tar should be applied at a temperature of 300 to 320 degrees Fahr. by being poured into the joints with a vessel very much like a sprinkling pot without the rose. The success or failure of the tar filling depends on the efficiency and care of the person in charge of heating the tar. If the tar is boiled until it is too hard, it pulverizes in very cold weather; if it be too soft, it runs and becomes sticky in very hot weather.

The cost of a tar filler depends upon the locality of the pavement and the closeness of the joints. One gallon is generally sufficient for one square yard of pavement; and the total cost of the filler usually varies from 10 to 12 cents per square yard of pavement.

Tar is slightly superior to sand as a joint filler, since it makes a perfectly water-tight joint; but on the other hand it costs five or six times as much as sand, and requires more care in its application.

The objections to tar are: 1. In summer it is likely to melt and run out of the joints; and in winter it is brittle and likely to chip. 2. The heating of it makes unpleasant odors on the street.

ASPHALT FILLER.

Sometimes asphalt is mixed with the tar to make it less susceptible to changes of temperature, and sometimes asphalt is substituted for the tar. Unfortunately a mixture of tar and asphalt is often referred to as tar, and sometimes as asphalt, and other times as pitch,—a term also applied to both asphalt and tar;—and consequently it is difficult to determine the practice in different cities. A common composition of a so-called "asphalt" filler is: refined asphalt, 20 parts; residuum oil, 3 parts; and coal-tar distillate No. 4, 100 parts.

The writer knows very little about the use of a filler composed wholly or in part of asphalt; but can not see how it can differ materially from a corresponding grade of tar. Further, as it is practically impossible for a non-expert to distinguish between tar and asphalt, and also as asphalt is easily spoiled in its preparation, it can not be commended as the ideal joint filler for a brick pavement.

CEMENT FILLER.

The most common joint filler, other than sand, is a thin mortar composed either of neat Portland cement or of one part cement and one part fine sand, the latter proportions being the more common. The application of this form of filler requires some care, but unlike tar or particularly asphalt, the method is easily learned by a layman from a description.

The precautions to be taken in applying cement filler are as follows: The pavement should be completely sprinkled immediately before the grout is applied. The sand and cement should be mixed in batches, say, of not more than 40 or 50 pounds of each at one time, in a tight mortar box. The box for this purpose should be 3½ to 4 feet long, 27 to 30 inches wide, and 14 inches deep, and should have legs of different lengths, so that the mixture will readily flow to the lower edge of the box, which would be 8 to 10 inches above the pavement.

The sand and the cement should first be mixed dry, and when the dry mixture assumes an even and unbroken shade, water should be added in a sufficient quantity to form a grout of the consistency of thin cream. The grout should be removed from the box to the pavement with a scoop shovel, and not by overturning the box upon the pavement; since by the last process the sand, cement, and water are separated, and are deposited in different portions of the pavement. While the box is being emptied, the grout should be constantly stirred to prevent a separation of the sand from the cement; and after the grout has been applied to the pavement, it should be quickly swept into the joints with steel brooms. It is better that the joints should be only about half filled at the first application, since then there is a less depth of grout in the joints and consequently less liability of the separation of the sand, the cement, and the water.

To secure the best results, a mortar box should be provided for each 10 feet of width of street, and the full width of the street should be filled at practically the same time. After the filling has been carried forward for 40 or 50 feet, the same space should be filled again in like manner, except that the mixture for the second filling should be slightly thicker than the first. The joints should be filled entirely to the top in the second application. After the joints have thus been filled, a half inch of fine sand should be spread over the entire surface of the pavement; and if the weather is very hot or dry, the sand should be sprinkled at intervals for two or three days, to insure that the cement does not lose by vaporization the water necessary for chemical combination in setting. Traffic should be kept off the pavement from seven to ten days, or at least until the cement has firmly set. If the cement filler is disturbed before it is fully set, it is practically no better than sand. If the cement filler is put in as described above and allowed to set firmly before being used, it will wear no faster than the best paving blocks and will prevent spalling and chipping of the bricks at the edges and corners.

The amount of grout required will vary with the openness of the joints, and with the quantity of sand of the cushion coat that works up into the lower part of the joints while the bricks are being rolled. With a 2-inch cushion and thorough rolling with a 5-ton roller, the sand will be forced up from ¼ to ½ inch. With a grout mixed 1 to 1, a barrel of cement will fill from 25 to 40 square yards; and with a grout composed of 1 part cement and 1½ of sand, a barrel will fill from 40 to 60 square yards.

If the grout is mixed in large quantities and dumped upon the pavement, it will require about one hour of labor for each 25 square yards. The cost of labor in applying the grout in small quantities as described varies from 1 to 1.25 cents per square yard. The cost of the cement filler will depend upon the price of cement and the care employed in applying the grout. With ordinary repressed blocks and reasonable care in securing close joints, the cost of a 1 to 1 Portland-cement grout will usually vary from 8 to 12 cents per square yard. If the grout is dumped from the box upon the pavement, the cost will probably be from 8 to 10 cents per square yard; but if it is mixed in small quantities and applied as described, the cost will probably be 10 to 12 cents.

One advantage of the cement filler is that it protects the edges of the bricks from chipping, and thus adds to the durability of the pavement. When the joints are filled with sand or tar, the edges of the brick will chip off, the upper faces wear round, the pavement becomes rough, and the impact of the wheels in jolting over the surface tends to destroy the brick; while with a good cement filler, the edges do not chip, the whole surface of the pavement is a smooth mosaic over which the wheels roll without jolt or jar, and consequently the life of the pavement is materially increased.

A second advantage of the cement filler is that it makes the layer of brick act as a solid sheet and supplements the strength of the foundation. Experiments* conducted at the University of Illinois in co-operation with Mr. O. L. Gearhart, City Engineer of Champaign, show that if a Portland-cement filler is applied in the manner specified, the layer of brick becomes a beam with approximately the same resistance to bending as a 6-inch layer of the natural-cement concrete ordinarily used in a pavement foundation. Therefore if a 6-inch natural-cement concrete foundation is strong enough with a sand filler, it is substantially twice as strong with a Portland-cement filler. Again, if a brick pavement having a sand filler and a 6-inch natural-cement concrete foundation is sufficiently strong to carry the travel, a pavement with a Portland cement filler and a 6-inch foundation of broken stone without any cement will also carry the travel.

A little computation will show that the cost of the cement filler is about the same as that of the cement in the usual concrete foundation. Therefore, it would be better economy to employ the cement in the joint filler than in the concrete foundation, since in the former case the cement gives rigidity and also protects the edges of the bricks from chipping; while the cement used in the foundation gives only rigidity.

CONCLUSION.

Cement filler protects the edges of the bricks from spalling, better than sand, tar, or asphalt. Cement filler, when properly applied, causes the layer of brick to act like a beam, and therefore the pavement requires a less strong foundation; while a sand filler adds no beam strength, and tar or asphalt little or none,—particularly during hot weather. It is better economy to use a good Portland-cement filler and omit the cement from the foundation, i. e., use a macadam foundation instead of a concrete one, than to use a sand filler and a concrete foundation. This principle is commended to the thoughtful consideration of the officials and property holders of the cities of Illinois.

Mr. President: There are no questions in the question box, so the report of the treasurer will be made.

Mr. Hammerschmidt: I have to report as follows:

Balance on hand	$ 46.05
Rec'd from Secretary Hartwell	106.00
Making amount in treasury	152.05
Bills to be allowed	95.72
Balance in treasury	56.33

Mr. Mamer moved that it be adopted, and Mr. Purington added "that he turn it over to us; I saw that he put it in his pocket." (Laughter.) Motion was carried.

Pres. Butterworth: I will appoint on the committee for the Department of Ceramics; D. V. Purington of Chicago, Dr. A. L. Converse of Springfield, Wm. Hammerschmidt of Lombard, Walter Colyer of Albion and John W. Stipes of Champaign.

Mr. Dunlap: I want to make a motion that we send a telegram congratulating our ex-president, C. J. Hess, of Coffeyville, Kansas, who is to be married this evening. Secretary Hartwell was instructed to send such message.

The report of the outstanding bills of the association was read and approved as follows:

Paper, envelopes and blanks	$ 9.00
Expense in arranging meeting	11.25
Cartage, etc.	1.75
1,000 letters	2.00
Badges	11.80
Programs	10.25
Stamps	11.20
Secretary's fees	15.00
Expense for sand-lime brick investigation	23.47
Amount in full	$95.72

Mr. Mamer, chairman of the Committee on Resolutions, reported as follows:

Whereas, the 27th annual convention of this association met at Champaign with the largest enrolled membership in its history; therefore be it

Resolved, that the sincere thanks of this association be tendered the officers for their faithful service during the past year.

Resolved, that we appreciate and tender our thanks to our host and fellow craftsman John W. Stipes for the royal entertainment he has given us.

Resolved, that we extend our sincere thanks to the members who have prepared the instructive papers for our benefit, and in particular do we appreciate the services rendered by the professors of the University of Illinois for the investigations and tests made, and the papers prepared by them; and we recommend that the traveling and freight expenses for the sand-lime brick investigation, amounting to $23.47, be paid from the association funds.

Also that we appreciate the courtesy of the managers of the Beardsley hotel.

J. M. Mamer,
C. C. Barr,
L. R. Whitney.

Mr. Stipes: I wish to thank you, gentlemen, for coming here, and it has been a great pleasure to me. I hope you will come every other year, if not every year. I will see that you have a place to stay.

Mr. Robb: I move that we come back right away now.

At this point Mr. Stipes tried to get the floor.

The President: Nominations are in order. Mr. Stipes has the floor.

Dr. Converse: Has he got the floor? I don't believe he has. I found out last night at that banquet that Mr. John W. Stipes was my brother, and the best thing I can do is to nominate him as the president of this association. I have known him for a number of years, and I have found out that this city stands by him in every way, and I know that this association stands by him, and would like to have him as presiding officer. I therefore nominate him.

Mr. Purington: I want to second that nomination, and I want to get ahead of Mr. Stipes, because some way or other he has got hold of the fact that he was going to be nominated, and he "kicks like a steer" and he says that he can't do it and won't do it; but as I told him, no member of this association has the right to set up his individual opinion against the unanimous opinion of every member of this association. I want that made plain to Mr. Stipes, that he has no right in any sense of the word to decline the nomination, and such an election as this would be to him. I will move that the secretary cast the unanimous vote of this association for Mr. John W. Stipes for president for the coming year.

Secretary Hartwell announced that the vote was so cast.

Dr. Converse: Gentlemen, I give way to Mr. Stipes. He now has the floor.

There were cries of "Come up front," and Mr. Stipes said: I wish to thank you for the honor that you have conferred upon me, but I assure that it is a thing that it is almost impossible for me to take. As to making a speech, I never made one in my life.

Mr. Purington: You are making one now.

Mr. Stipes: And to preside over a body of men of this kind, I feel that it would be a failure on my part.

Mr. Purington: It is time that you learned.

Mr. Stipes: But if you still insist on it, I will try and do the best I can. (Applause.)

Mr. Hammerschmidt: Mr. President, I would like to put in nomination for vice president Mr. Walter M. Pratt, of Earlville.

Mr. Joannis: I second the motion, and I move that the secretary cast the ballot for the entire association.

After this was done, Secretary Hartwell announced that Walter M. Pratt of Earlville was elected vice president.

Dr. Converse: I move the election of the present incumbent, Mr. Hartwell, as secretary for the ensuing year, and that the Chair be directed to cast the unanimous ballot of this association.

The Chair then announced that Mr. George H. Hartwell was elected secretary.

On motion of Mr. Purington it was moved that Wm. Hammerschmidt be re-elected treasurer of the association, and that the secretary cast the vote. Which motion was carried, and Secretary Hartwell so announced. The chairman then announced that the convention was adjourned, but that the special car would leave the headquarters at the Hotel Beardsley at 2 o'clock to go to the University.

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*Nineteenth Annual Report (1904) of the Llinois Society of Engineers and Surveyors, p. 111-15.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

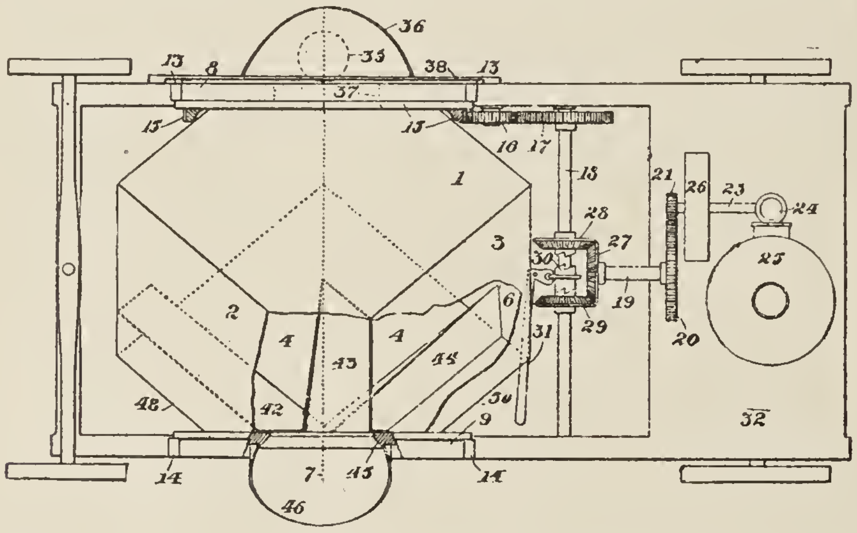
These new inventions are those that are especially of interest to any one engaged in the line of building materials and their manufacture, or machinery to make them.

775,222. Process of Making Artificial Brick or Stone. Louis F. Kwiatkowski, New York, N. Y. Filed Dec. 29, 1903. Serial No. 186,960. (No model.)

Claim.—1. The process of producing artificial stone or brick from a composition including lime and sand consisting in simultaneously incorporating and pulverizing the entire quantity of unslaked lime and part of the sand in its natural moist state, whereby the lime is partially hydrated and the moisture in the sand thereby absorbed and the ingredients thoroughly ground and intermixed, thereafter adding the remaining quantity of sand in its natural state together with sufficient moisture to complete the hydration of the lime, intermixing the ingredients, then molding said mixture, and thereafter subjecting same to the action of superheated salts-impregnated steam under pressure, substantially as described.

2. The process of producing artificial stone or brick from a composition including lime and sand, consisting in simultaneously incorporating and pulverizing the entire quantity of coarse granular unslaked lime and part of the sand in its natural wet state and thereby partially hydrating the lime, adding and mixing additional granular sand, completing the hydration of the lime, molding said mixture, and thereafter indurating same by the action of superheated salts-impregnated steam under pressure, substantially as described.

775,242. Mixer. William J. Judd, Parkridge, N. J. Filed July 9, 1904. Serial No. 215,906. (No model.)

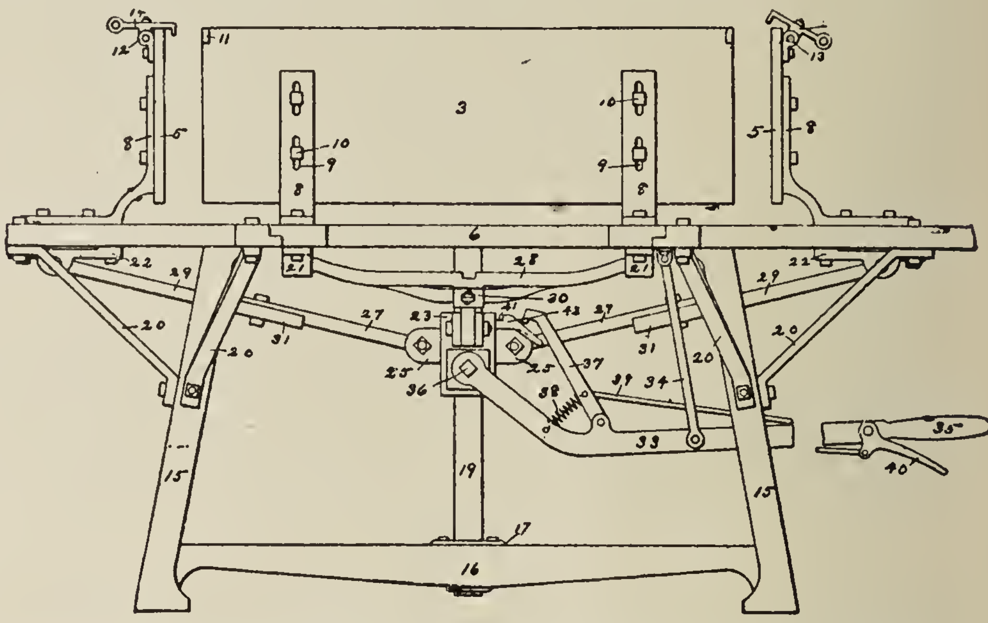


Claim.—1. In a mixing-machine, the combination of a revoluble mixing-barrel having at one end a charging-opening, a discharge-bucket therein and revolving therewith; said mixing-barrel being larger at its body portion than at its discharging end, so that its contents tend to settle in the larger portion of the barrel during the revolution thereof, and said bucket extending to said body portion and being closed at its inner end and inclining therefrom toward the axis of revolution.

777,070. Concrete-Block Machine. George Brady, Jackson, Mich. Filed Feb. 12, 1904. Serial No. 193,235. (No model.)

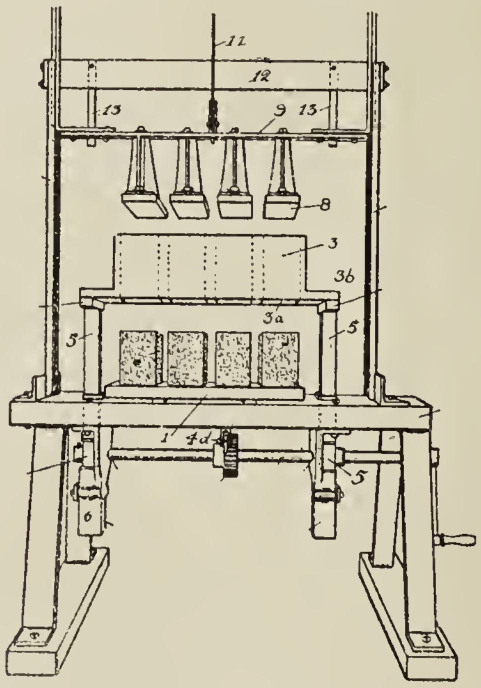
Claim.—In a block-molding machine, the combination of a table having a plurality of ways, blocks slidable horizontally on the same plates secured to said blocks, bearings secured to said blocks, a vertically-slidable hub, yokes pivoted in said bearings, and links connected to said hub and having an adjustable connection with said yokes.

In a block-molding machine, the combination of a table having ways at right angles to each other, blocks slidable in said ways, brackets secured to said blocks, vertical plates adjustably secured to said brackets, bearings secured to said blocks, yokes pivoted in said bearings, legs for said table, a frame extending between the legs, a sleeve in said frame, a vertical shaft secured at one end in the table and at the other in said sleeve, a hub slidable on the shaft and having lugs, links pivoted to said lugs and adjustably connected to said yokes, a notched bracket secured to said hub, a link pivoted to the table, a lever supported by said links and having a forked end pivoted to said hub, and a U-shaped hooked latch to engage said notched bracket and thereby lock all the movable parts of the machine.



777,086. Brick-Molding Machine. John H. Emery, West Bay City, Mich. Filed Oct. 20, 1904. Serial No. 229,305. (No model.)

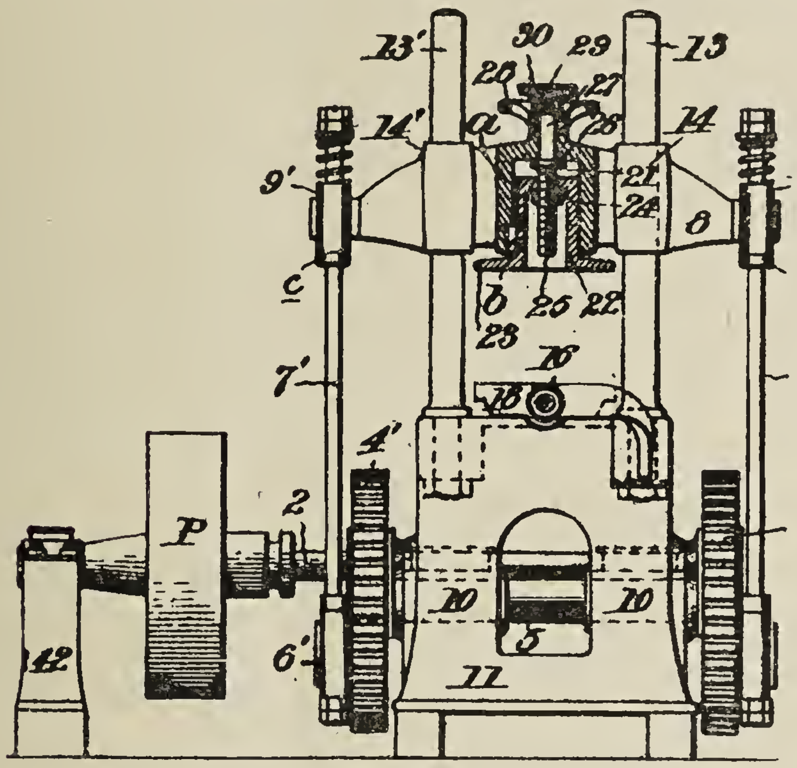
Claim.—1. In combination with the stationary table and a removable tray resting thereon; of a mold above said tray, comprising a plurality of open cells and having laterally-extending flanges; a pair of brackets secured beneath said table; vertical guides on said brackets; a rack vertically movable in said guides and passing through the table; the upper ends of said racks engaging the flanges of the mold to lift it; a horizontal shaft revolubly mounted in said brackets; a pair of pinions on said shaft meshing respectively with said racks; a ratchet-wheel on said shaft; a pawl carried by the table and engaging said wheel; vertically-movable tamping-feet; registering respectively with said cells, and catches to suspend the tamping-feet above said mold, substantially as described.



777,277. Tile-Press. William R. Cunningham, Bucyrus, Ohio, assignor to The American Clay-Working Machinery Company, Bucyrus, Ohio, a Corporation of Ohio. Filed Sept. 7, 1904. Serial No. 223,615. (No model.)

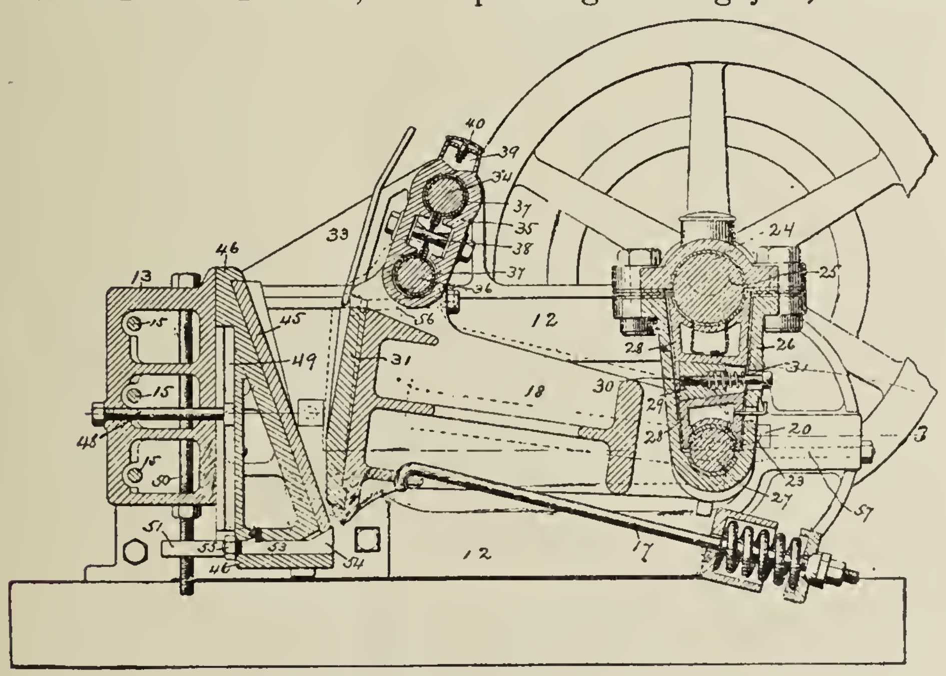
Claim.—In a press of the character described, the combination with a reciprocable table, a support therefor, said table tiltably mounted relative to said support, and a pressure device, of a ball-bearing between the support and table and comprising balls loosely carried by one of said parts and traversable over the other part.

A press of the character described having in combination a frame; a longitudinally-extending guide, a pair of tiltable tables on said guide and alternately operable; means whereby the tables are alternately moved onto and off the frame; a platen; a reciprocable cross-head carrying the platen, said tables movable into and out of the range of action of the platen; means for operating the cross-head; antifriction devices carried by the tables and coacting raceways on the frame in the range of action of the said devices and engaged thereby during the movement of the tables onto and off the frame.



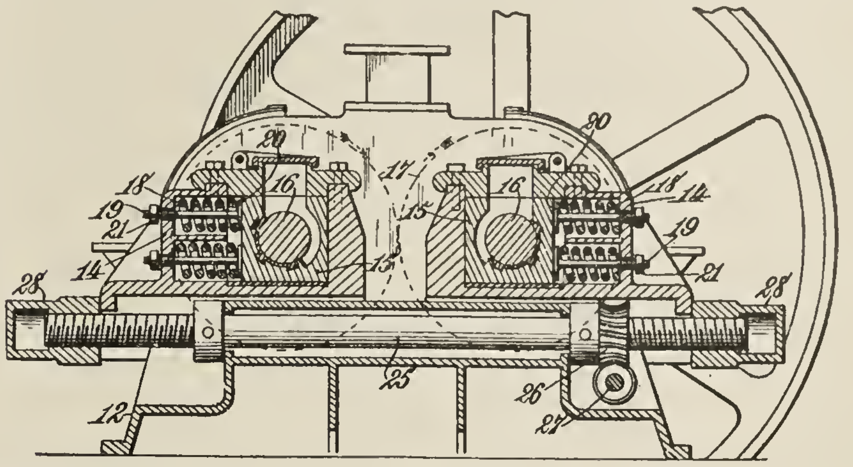
777,227. Crushing-Machine. Thomas L. Sturtevant, Quincy, and Thomas J. Sturtevant, Newton Center, Mass., assignors to Sturtevant Mill Company, Portland, Me., and Boston, Mass., a Corporation of Maine. Filed Oct. 6, 1902. Serial No. 126,170. (No model.)

Claim.—1. In a rocking-jaw crushing-machine, the combination with a U-shaped machine-frame open at its rear end and having side parts provided with projections to form buttresses for toggles, of a fixed or normally stationary jaw mounted in said frame, a co-operating rocking jaw, a rocking-jaw frame also mounted in said machine-frame and carrying said rocking jaw toggles interposed between the rear parts of said rocking-jaw frame and the said buttresses of said machine-frame, and means for operating said rocking-jaw frame.



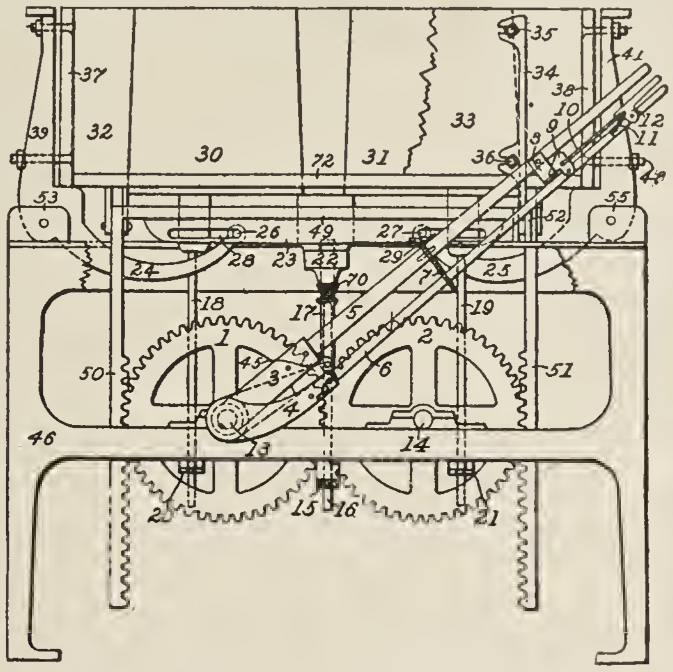
777,448. Roll Crushing-Mill. Thomas L. Sturtevant, Quincy, and Thomas J. Sturtevant, Wellesley, Mass. Filed June 1, 1904. Serial No. 210,735. (No model.)

Claim.—1. In a roll crushing-machine, the combination with a pair of crushing-rolls and shafts by which said rolls are carried, of bearing-boxes for said shafts, open-topped carriers or pedestals supporting said bearing-boxes and suitably recessed, said boxes being movably mounted in said carriers or pedestals, springs in the recessed portions of said carriers or pedestals, for yieldingly forcing said crushing-rolls toward each other, and means for relaxing or removing the pressure of said springs from said bearing-boxes when it is desired to remove said boxes from said open-topped carriers or pedestals, or insert said boxes therein.



777,557. Machine for Forming Concrete Building-Blocks. John H. Stewart, Waterloo, Iowa, asignor to Stewart Cement Block Machine Company, Waterloo, Iowa. Filed May 24, 1904. Serial No. 209,438. (No model.)

Claim.—1. A machine for forming concrete building-blocks, consisting of the combination with a mold having swinging sides and ends, of a reciprocating core, a reciprocating bottom plate having openings for the core, mechanism connecting and operating the core, the swinging sides and ends and the bottom plate, and a two-part lever adapted to actuate the core either simultaneously with or independently from the said sides and ends and bottom plate, substantially as shown and described.



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RECEIVER ASKS BIG FEES.

Henry Tatnall, receiver for the Asphalt Company of America and the National Asphalt Company, at Trenton, N. J., filed his final report reviewing the history of his receivership and showing a balance on hand of $38,887.67.

Counsel for Mr. Tatnall asked that the receiver be allowed $50,000 for his personal services and $35,000 for counsel fees.

Counsel for the Land Title and Trust Company of Philadelphia objected, and suggested $5,000 was ample for the receiver. Judge Lanning reserved his decision.

CLAY RECORD.
PUBLISHED SEMI-MONTHLY BY THE
CLAY RECORD PUBLISHING COMPANY,
Ninth Floor, Plymouth Building,
303 Dearborn Street,
CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.
Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVI. JANUARY 30, 1905. No. 2

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

CONVENTIONS.

The seventh annual meeting of the American Ceramic Society will be held at Birmingham, Ala., January 30th and 31st, 1905.

The fifth annual meeting of the Wisconsin Clayworkers' Association will be held at Manitowoc, February 23 and 24, 1905.

The nineteenth annual meeting of the National Brick Manufacturers' Association will be held at Birmingham, Ala., January 31st, February 1st, 2nd and 3rd, 1905.

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A stiff upper lip is almost as good as a bank account.

Are you attending all of the conventions? None of them are so poor that you cannot learn.

The Clay Record—semi-monthly—and only costs one dollar for a year, has a larger circulation than all other American clay journals combined.

Don't sit on the fence waiting for opportunities to come along to give a ride. Get out into the middle of the road and hoof it awhile for exercise, if nothing else.

The spring work will soon be ready. Let's be ready. Is all your machinery in "apple-pie" order? If not, put it so. Remember the factories will be crowded with repairs soon.

Remember that it is the man at the small end of the horn that makes the music. Don't start in with twice as big a plant as you ought to have. Start small and grow.

The clay workers of the states of Illinois and Iowa, respectively, have held their annual meetings for the current year of 1905. The attendance upon these meetings combined equals that of any attendance ever had at any meeting the National Association ever held; and if the attendance is any criterion of the interest taken by the members of these respective state associations, then it will not be disputed that the interest, instead of being on the wane, is growing. Again, taking into consideration the papers read, their subjects and the manner in which they were treated, so thoroughly, so scholarly and scientifically, the conclusion is justifiable that the members of the state organizations are awake to the benefits they are securing from these meetings; these benefits being manifested in keeping them abreast with the scientific developments and improvements in the Art, securing to themselves a knowledge of the methods of their co-workers, besides fully posting them regarding the ever growing and widening demands of the trade.

We cannot but congratulate the members of the Illinois and Iowa associations upon what they have accomplished, and at the same time extend to them our best wishes for their future progress and prosperity.

"The greatest good to the greatest number" is the underlying principle of this government, and, is accepted by the people, who, while simple-minded enough, clearly understand that to satisfy everyone is an impossibility; that certain laws will be grievous to some; that the interests of a few will clash with the interests of the many, but that the country may prosper and grow, concessions must be made, and what is unquestionably and undoubtedly good for the majority must be accepted and approved as good for all.

We are of opinion that to meet the crisis now confronting this people, and to overcome it, the foregoing principles must be recognized and more generally understood than at present is the fact.

It is difficult to explain and account for the fact that certain things, in themselves purely business matters, and in no sense political, have been treated as political matters, and when up for consideration are regarded as such, the people lining up themselves with whatever positions their respective political parties take on the questions. Take, for illustration, the Tariff question. Now, our contention, *this question is, in no possible or legitimate interpretation, a political matter,* and that because it has been permitted to become one by the people is proof of the folly of it, and the dear people have paid for it, of this there is no doubt; and the result has been that the few have been enormously benefited at the expense of the many; and the ten million Americans reduced to poverty is one of its effects. Taking this question out of politics and treating it as a business proposition having regard for the masses, becomes the duty of the next Congress, and if we have read rightly the sentiment of the people this treatment of the question is demanded by the people, and if the legislation be at all uncertain woe betide the legislators, and there will follow such an uprising among the people this country has never experienced. We shall have occasion in the future to supplement this discussion of the subject with further discussions, because we regard the subject as non-political and non-partisan, as a subject of the profoundest interest to all the people because no other so affects their well being.

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TILE MEN AT ALEXANDRIA.

The Indiana Drain Tile Makers' Association met in regular bi-monthly session here, January 18, to talk business and incidentally take care of a good dinner in the meanwhile. There was nothing to give out, they said, and the meeting coming as it does between sessions, was largely a social event. In the meeting were S. C. Cowgill, Montezuma; J. M. Powell, Orestes; Frank McConaughty, Amboy; George W. Lane, Herbst; C. Baum, Sweetser; P. P. Parnell, Goldsmith; J. G. Slusser, Hobbs; J. W. Arbuckle, Hômer; W. C. Hooven, Portland; E. W. Geik, North Manchester; Fred Baum, Sweetser; James Luther, Terre Haute; D. B. Davis, Anderson; L. R. Whitney, Terre Haute; F. D. Oakley, Terre Haute; J. B. Casey, Colfax; S. M. Cowgill, Terre Haute; H. M. Hindman, Lawrence; R. A. Brown, Gaston; J. S. Zingerman, Brownsburgh; T. J. Lindley, Kempton; J. C. Taylor, Goldsmith; M. McKay, Windfall; Lee Goodwin, Curtisville; G. A. Nelson, Greenville, Ohio. So pleased has the association been with the fare and courtesies that the Madison Hotel has been giving them that they designated it official headquarters and have held all their meetings there for several months.

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TEXAS BRICK FOR THE PANAMA CANAL.

The Beaumont (Texas) Brick Company will in all probability furnish the Isthmian Canal Commission with several million brick to be used in building abutments and foundations for the heavy timbers and machinery at various points along the big ditch.

Col. Sam Parks, the president of the company, says that the contract for supplying the brick has been practically closed and that the shipments will be made from here over the Gulf and Interstate to Galveston, and by vessel from there.

This will be the first canal contract landed by Beaumont, although the Sabine Tram, Nona Mills Company and the Industrial Lumber Company have submitted bids twice for the furnishing of lumber.

RECENT FIRES AND LOSSES.

The sale of the United States Clay Manufacturing Company's plant at Griffin, Ill., including the clay, coal and farming lands, has been made; consideration, $42,424.

The two plants of the Hall Brick Company at Detroit, Mich., are to be sold by order of the United States Court. The company went into bankruptcy some little time ago.

An expensive blaze occurred in Rodgers & Bell's brick plant at New Lexington, O. The kiln and sheds are a total loss.

A petition in involuntary bankruptcy has been filed against the Syracuse China Company, of Syracuse, N. Y. The company was incorporated last May with $150,000 capital stock. The president is John R. Dingle of Westfield, Pa.

Attorney E. N. Baer has been appointed the receiver for the Shenango China Company, New Castle, Pa. He was the president of the company. The liabilities are $155,000 and the assets $45,000 more.

A petition of involuntary bankruptcy has been filed in the United States Court at Ft. Dodge, Iowa, asking that the Lehigh (Iowa) Clay Works be adjudged bankrupt. The petition was filed by H. R. Heath and others; liabilities amounting to $20,000 were filed.

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WEBER WITHDRAWS FROM THE ILLINOIS BRICK COMPANY.

Important new competition is developing for the Illinois Brick Company. It transpired that the resignation of B. F. Weber as director and vice-president of the company was due to plans which he had already formed to start a new concern. It will be known as the National Brick Company, and the capital stock will be $500,000. Incorporation papers have already been forwarded to Springfield. Offices for the new company will be secured in the down town district within a few days, and the work of organizing the company and arranging for the construction of brick making plants will be begun at once. It is the intention to start active operations as soon as the weather will permit.

While Mr. Weber is not ready to tell who will be associated with him in the organization of the new company, it is intimated that several of the people prominently identified with the Illinois Company will be in the new venture. Mr. Weber said that "all of the real brick men in the Illinois Company will be in the new concern." Mr. Weber said:

"I did not resign from the Illinois Company on account of any dissatisfaction with the reorganization plan. I signed the report of the reorganization committee with the other members. The reason I resigned is that I am starting a new company to compete with the Illinois Company. People around town were beginning to think that the brokers were running the Illinois Brick Company, and some of us decided to start a new concern. We got a good price for our stock. We sold our old clothes and are now going to buy new suits."

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A. Hoover, Fultonham, O., has secured the contract to furnish shale to the two brick yards, and has bought a steam shovel to load the material.

CEMENT USERS FORM A NATIONAL ASSOCIATION.

Much rivalry and diplomacy was exercised by candidates at the convention of cement users, which was held at the Claypool, Indianapolis, January 17-18-19. At the meeting in the afternoon the time was taken up with the reading and discussion of papers, and the meeting adjourned early to make ready for the evening session, at which time it had been announced that a constitution and by-laws would be adopted, together with the election of officers, John F. Given of Circleville, O., vice-president of the New Circleville Canning Company, was elected chairman of the meeting and called in the committee of ten, which had been assigned to draft a constitution. On account of the dissatisfaction of several delegates in regard to the publication and suppression of certain official matters the business was postponed.

The election resulted as follows: President, John P. Given, Circleville, O.; Vice-President, A. M. Boetzman, Chicago; Second Vice-President, John H. Fellows, Pennsylvania; Third Vice-President, H. C. Quinn, Georgia. The secretary and treasurer will be chosen by the executive board.

The names of the officers were presented to the assembly by a committee of ten appointed to look after the constitution and by-laws of the association.

For almost two hours there was a bitter fight between two factions—the block men and the reinforced concrete men, commonly known as "machine men."

When J. H. Swift proposed the names of the candidates for the various offices, it was found that almost every man was connected with a manufacturing concern, and this caused the trouble. It was the general opinion that the men wanted the offices merely to "push" their machines on the market, but finally the names proposed were accepted and the motion was made unanimous.

After the morning session adjourned, the entire body went to the roof of the hotel, where a group picture was taken.

"Quality of Sand" was the subject of a paper read before the assembly last night by James C. Hain, engineer of masonry and construction of the Chicago, Milwaukee & St. Paul Railway. This paper was followed by a discussion on "The Mixture of Concrete," by J. P. Sherer of Milwaukee.

The closing address was by Richard L. Humphrey, of Philadelphia, an expert member of the committee on testing cement, appointed by the American Society of Civil Engineers, and who was demonstrator of the United Portland exhibit at the Louisiana Purchase Exposition. Mr. Humphrey illustrated his address with stereopticon views.

Many cities are "bidding" for the convention next year. Those that are in the lead are Milwaukee, Columbus and Chicago.

After the business meeting this morning a number of papers were read.

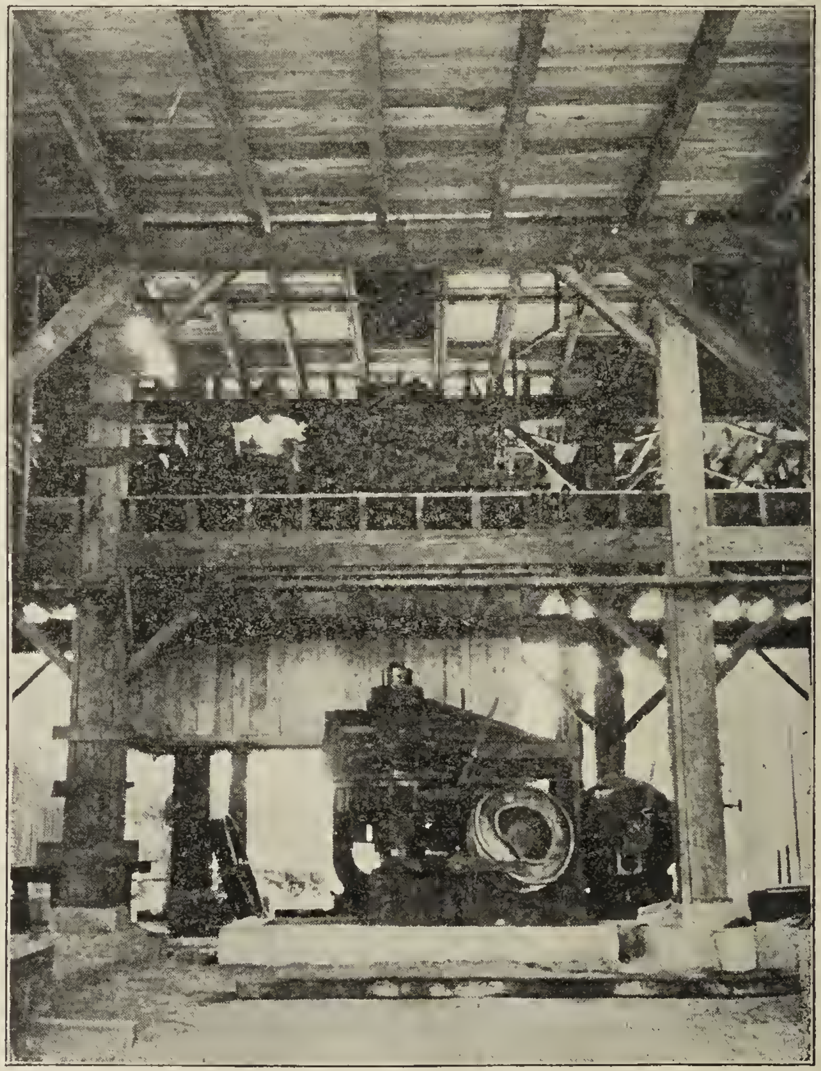
A reception will be tendered the delegates by the Commercial Club. A musical programme was given, and the affair was in the nature of an informal reception.

Machinery of all kinds pertaining to concrete and cement work was set up, and the rooms were usually filled with delegates watching the demonstrations. There are about fifty exhibits of various devices and samples of the finished product.

A NEW AMERICAN ROTARY PRESS.

At the recent convention held in Cincinnati by sand-lime brick manufacturers, special attention was called to the superiority of the rotary type of press for sand-lime brick.

The enclosed cut illustrates the highest type in the development of the Rotary Press, and is such as is furnished by the Schwartz System Brick Company of New York in the various plants which they are erecting. This press is the result of American engineering ability applied to the rotary presses, which have been used so successfully for many years in other countries, but while those in use elsewhere have furnished the nucleus for development, this is distinctly an American product, and includes all the ingenuity and perfection only displayed by the American engineer.



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BRICK FROM REFUSE SLATE.

A company is being formed at York, Pa., for the purpose of diverting the refuse slate at Beach Bottom quarries to commercial uses. All slate that does not split even into blocks is condemned to the refuse piles. Some of the blocks going to waste are as large as small houses. It is the purpose of the proposed company to build a plant at Delya for grinding the refuse into powder to be used for brickmaking. By a process invented by one of the promoters of the project it is said that a fine quality of brick can be produced. Plans are already made for the plants and kilns.

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The Ellicott Brick Co., Jewettsville, N. Y., a two-year-old concern, made 2,000,000 brick in 1903, and 5,500,000 in 1904; 3,500,000 of the latter went into a wheel pit at Mayom Falls, Ontario, and 500,000 to the Lackawanna Steel Company. They have four permanent kilns and will increase their output in 1905.

HOW SAND-LIME BRICK STOOD A FIRE.

Little Rock, Ark., Jan. 20, 1905.

Mr. S. M. Apperson, care Granite Brick Co., Memphis, Tenn.

Dear Sir:—I know that you are interested and would like to know how the sand brick stood in the recent fire.

After we had our building constructed, I had a great many misgivings as to whether the sand brick would stand fire, for many of the insurance men were inclined to be prejudiced, on account of the brick being, in what they term, experiment, and were afraid that it would not stand against heat and water.

At the time we built our building, the brick plant here had not been completed, and they were not in a position to furnish us with brick as rapidly as we wanted them, and it was necessary to mix clay brick on the inside work, and on the back wall between the two warehouses. Part of the wall was built of the red brick entirely; part of this wall is now standing. The red brick was burned out, at least two or three inches. The white is intact, the same way with all of the walls. The red brick had crumbled, while the white brick were perfectly sound.

This should be a great advertisement for your brick, and if you would have some of the skeptics run over and investigate, they would be convinced that this brick is far superior to the ordinary clay brick.

Yours truly,
Little Rock Furniture Co.,
E. J. Bodman, Secy.

THE CAROLINA PORTLAND CEMENT CO. IS SENDING AN ORDER OF FIRE BRICK TO MEXICO.

The Carolina Portland Cement Company, of Charleston, has received a contract for fire brick to be shipped to Tolosa, Mexico. These fire brick are known as the "Killian" brand, and are made at the large kilns located at Killian, S. C., a station on the Charlotte and Augusta division of the Southern Railway, above Columbia. The Carolina Portland Cement Company is general selling agent for these kilns, and which, it is understood, make a very superior grade of fire brick. In fact, this order is indicative of this. It is also understood that considerable of the stock of the Carolina Fire Brick Company (who make the "Killian" brand brick) is owned by Charlestonians.

The enterprise displayed by the Charleston company in securing this business is worthy of attention. It is also interesting to note the circuitous route and the long trip that these brick will take before they are finally put to the use for which they are intended. It is learned from Mr. Ford, of the cement company, that these brick will be first loaded in cars at Killian, and packed carefully in pine straw, which protects them in transit; thence, by the Southern Railway, they go to Birmingham, thence via the Frisco and Illinois Central Railway systems, to New Orleans, where the brick will be unloaded and packed in hogsheads, containing 300 bricks to the hogshead; they are then delivered over the Stuyvesant docks of the Illinois Central Railway Company to the Mexican Steamship Company, to go across the Gulf of Vera Cruz, Mexico, at which place they will again be unloaded and transferred to a smaller steamship line, which will take them on to Coatzacoalcos, Mexico, and used in the large plants of the Mexico Plantation Company, who have made the purchase through their La Crosse, Wisconsin, office, direct with the Carolina Portland Cement Company.

BEVELED BRICK BEST FOR ROADS.

According to an interesting experiment made by the street commissioner, Henry Nagel, of Davenport, Iowa, and others, beveled brick is the best kind of paving to be used on inclines where heavy loads must be hauled.

Mr. Nagel stated that a wagon was filled with rock and driven to scales, where it was weighed. The gross weight of the loaded truck was 7,010 pounds and the net weight was 5,490, or equal to two and three-quarters tons of coal.

One of the horses weighed 1,200 pounds and the other 1,300 pounds. The team and loaded wagon was first taken to Bridge avenue, where there is a 10 per cent grade and the street is filled with a gravel center. Then the load was taken to Mississippi avenue, where there is a 10.90 per cent grade and where the street is paved with smooth brick and this hill was tried. Lastly the load was taken to the alley north of Prospect drive, where there is a 12 per cent grade and beveled brick is used in paving.

The commissioner and those who were with him state that the team hauled the load up the last and steeper grade easier than it hauled the load up the other inclines. This, according to their statements, proves that the beveled brick is much the easier over which to haul loads, especially when the wagon must be taken up an incline. The reason given by those who tried the experiment is that the beveled brick gives the team an opportunity to get a foothold, while the other paving does not.

MAY FORM SELLING AGENCY AND BEGIN FIGHT.

Owners of independent brick plants in Columbus, Ohio, and its vicinity met at the residence of Adam Schneider, South Third street, for the purpose of taking some action looking to the disposal of the outputs of their plants.

There was some doubt early about the attendance, as several who were counted upon to participate in the discussions telephoned that they would be delayed and possibly unable to attend even later.

The manufacturers who are now disposing of their brick through a sales agency feel that it is necessary to get together, it is understood, and advance their interests as an organization rather than as individuals.

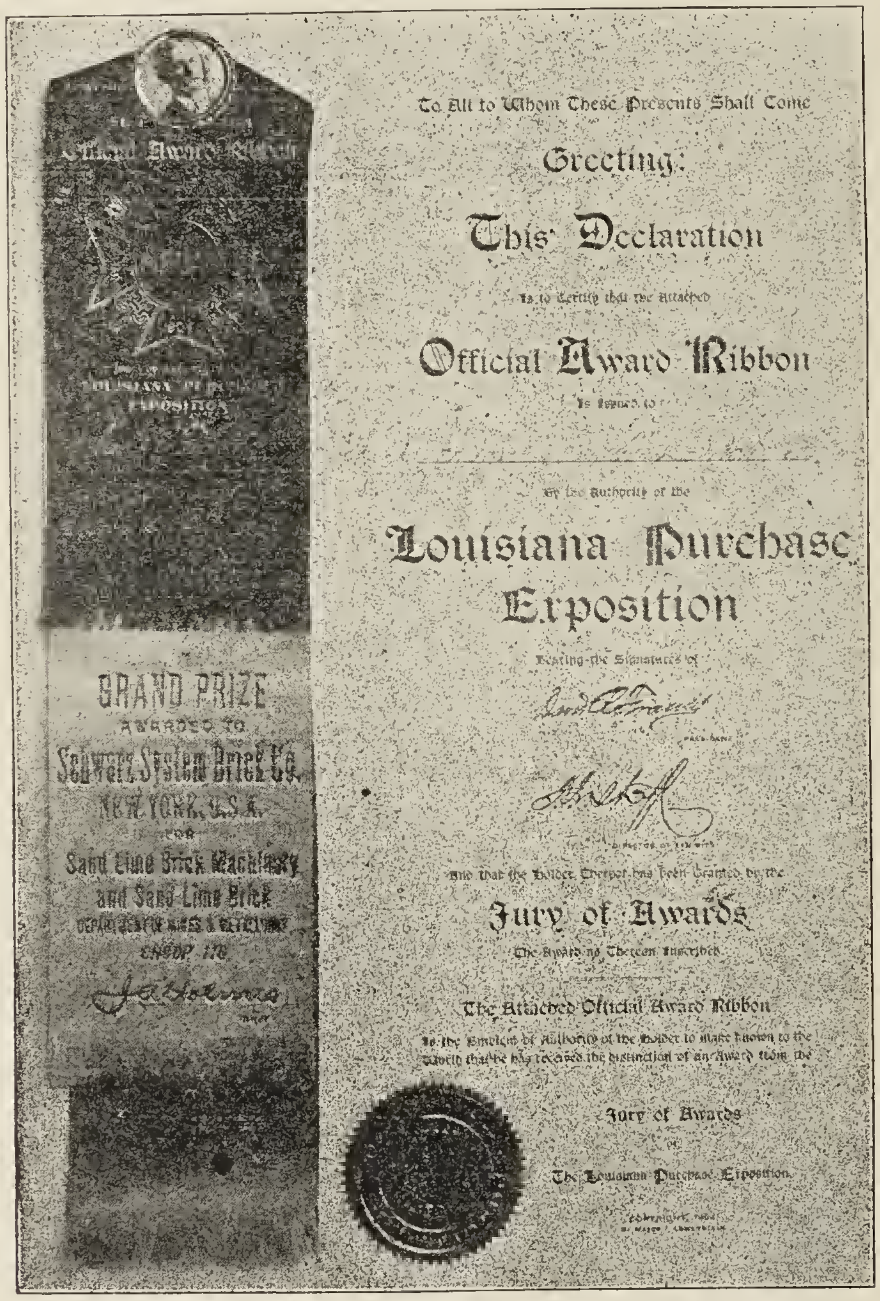
It is further claimed that a fight between the principal selling agencies is the probable outcome of recent developments in the brick business.

Just what will be done by the independents seemed to be uncertain before the call of the conference, but it was the consensus of opinion that the independents would unite their selling interests and either organize a selling agency or adopt a working agreement.

Tuesday afternoon the Columbus Contractors' Supply Company increased its capital stock from $30,000 to $250,000 to provide money with which to take over the Franklin Brick Company. Of the capital $50,000 will be the treasury stock. The new plant will cost the company in the neighborhood of $125,000.

THE SCHWARZ COMPANY WILL ERECT PLANT IN CALIFORNIA.

An interesting item of news in the sand-lime brick industry is that of a contract recently signed between the Schwarz System Brick Company of New York and Mr. W. F. Barnes of San Francisco, for the erection of a sand-lime brick plant in the latter city. Mr. Barnes is a man well known throughout the West, having for many years been engaged in the box, lumber, basket and barrel business. These various industries naturally employ a large quantity of machinery and this has placed Mr. Barnes in a position to judge intelligently of the various merits of the different kinds of machinery offered to the sand-lime brick industry. Mr. Barnes made a tour of this country, extending from the Pacific to the Atlantic Coast, and has visited several of the plants erected by each Company offering sand-lime brick machinery.



GRAND PRIZE
AWARDED TO
Schwarz System Brick Co.
NEW YORK, U.S.A.
FOR
Sand Lime Brick Machinery
and Sand-Lime Brick
GROUP 176

To All to Whom These Presents Shall Come
Greeting:
This Declaration
Is to Certify that the Attached
Official Award Ribbon
Is Issued to
By the Authority of the
Louisiana Purchase Exposition
Bearing the Signatures of
And that the Holder Thereof has been Granted by the
Jury of Awards
The Award as Thereon Inscribed
The Attached Official Award Ribbon
Is the Emblem of Authority of the Holder to make known to the World that he has received the distinction of an Award from the
Jury of Awards
of
The Louisiana Purchase Exposition

The selection of the machinery of the Schwarz System Brick Company by a man of the experience and standing of Mr. Barnes is quite an additional victory for the machinery which received the Grand Prize at the St. Louis Exposition. Mr. Barnes has been appointed the agent for the "Scientific System" for the States of Washington, Oregon, California, Idaho, Nevada, Utah, Arizona and New Mexico, and the plant which he will erect in San Francisco will undoubtedly be an important help to him in demonstrating to the purchasers in the above territory, the peculiar advantages and excellence of the Schwarz System Brick Company.

WANT BRICK CONTRACT.

Officers of the Southern California Brick Company, Los Angeles, Cal., the concern whose bid of $5.90 a thousand was the lowest received under the council's advertisement for 20,000,000 brick, with which to build the outfall sewer, offer the following statements in support of their claim for recognition in the award of the big contract:

"The Southern California Company's clay (at Boyle Heights) is superior to the clay at Inglewood, and the supply on hand is immense. It contains a considerable proportion of iron, which gives the quality indicated by a clear ring and non-absorbtion of water. The present capacity of the company's plant is about 1,000,000 bricks a month. On account of the superior quality of the clay about 75 per cent of sewer brick can be turned out from every kiln burned. The company has on hand about 250,000 sewer brick, that were selected to offer to the city under the original 8 per cent specifications.

"The company's new kilns are not merely contemplated, but are in actual course of construction, the large chimney to be used being already completed and in use and the construction of the remaining eight chambers of the kiln being in progress; they will be immediately completed, whether the company receives the city contract or not.

"If awarded the contract, the company could within thirty days supply 40,000 to 50,000 sewer brick a day, and in twelve days from this day it will produce, besides its other products, 25,000 brick that will comply with specifications for sewer brick, whether awarded the contract or not; and during the month that would elapse after receiving the contract and before the plant's capacity is increased, the 250,000 sewer bricks now on hand would make up any deficit in present capacity."

BANQUET GIVEN BY GEORGE R. HILL TO SEWER PIPE MEN.

George R. Hill, of Akron, O., president of the Sewer Pipe Manufacturers' Association of the United States, was the host at a complimentary banquet given to the members of the association at the Hotel Astor, Times Square, New York, Wednesday evening. It was in a sense an anniversary observance, and commemorated the third year of Mr. Hill's presidency of the association. There were twenty guests at the table. E. B. Winslow, of Portland, Maine, was toastmaster. The dinner was served in the yacht room of the hotel. The Akron guests who were present, besides Mr. Hill, were: B. W. Robinson, H. A. Manton, C. H. Palmer, T. A. Palmer and E. H. Gibbs.

FOUR NEW PLANTS FOR OAKLAND.

The construction of four manufacturing plants is to be commenced at Oakland, Cal., in the near future. Plans have been perfected for a branch of the Rose Brick Company, an Eastern firm, to be managed by H. C. Stillwell, of Fruitvale. The Plastic Company, a branch of the first mentioned company, will establish a tile factory at the same time. As a by-product a brick chemical and carbonic gas plant will be installed. Docks will also be built. Cost, $1,000,000.

PATENT FOR VALUABLE DISCOVERY ISSUED TO LITTLE ROCK MAN.

A patent has just been issued to Walter F. B. Berger, Little Rock, Ark., for making refractory brick out of bauxite, the ore from which aluminum is extracted.

The value of bauxite as a refractory material has been known for several years, but its lack of cohesive qualities has heretofore prevented its being molded into brick. This difficulty has been overcome by Mr. Berger's process, thus giving to the steel trade a practical and cheap brick for basic furnace lining to replace the expensive magnesite brick now so extensively used. The patent covers the use of a binder with calcined bauxite. The new process uses a natural bauxite from Arkansas, which is particularly low in silica, bonded by a small percentage of plastic fire clay. The amount of silica in the finished brick is considerably less than 10 per cent., and is not appreciably detrimental to its elasticity. The brick contains from 88 to 90 per cent of alumina, and from 10 to 12 per cent ferric oxide, titanic acid and silica. This brick is especially adapted for linings of basic open-hearth furnaces. The highest grade bauxite brick are used in the floor and walls up to the slag line, protected by a bed of calcined bauxite. Above the slag line cheaper brick, with a lower percentage of bauxite, may be used.

The price at which this brick will be sold is considerably lower than that of magnesite brick, and there are one-third more bricks to the ton. They have been given severe tests in several of the principal steel plants of the country, which have proved very successful. The brick is now on the market, being manufactured in St. Louis by the American Bauxite Company.

AKRON CAPITAL HAS BOUGHT THE LOGAN CLAY PLANT.

On Monday, January 16, the plant and business of the Hocking Clay Manufacturing Company, of Logan, Ohio, was taken over by the Logan Clay Product Company, which is composed almost entirely of Akron capitalists. Jacob Pfeiffer, a well-known local business man, is president and general manager of the new company, and as soon as he can he will move to Logan to take up his residence.

The local stockholders and directors are Mr. Pfeiffer, J. I. Brenizer, F. H. Holton, Joseph C. Weaver, E. D. Fritch, John Schoenstine, W. M. Mossison, Frank Converse and William Krumroy, of Inland. The Logan Clay Product Company was incorporated nearly a year ago under the laws of this state. Its organization was for the purpose of purchasing the plant at Logan, which has been operated successfully for the past fifteen years and was sold because its owners, the Haydens, of New York, who are multimillionaires, wished to retire.

The plant has two presses and 15 kilns for the manufacture of sewer pipe. Brick has also been manufactured by the old company. The new company will specialize in the manufacture of salt-glazed brick, which the plant has been turning out for several years. This product is claimed to be unrivaled. The brick are used mostly for mantels. Several mantels of this brick are in the city, and it is claimed that there is ready sale for all that can be manufactured. John Schoenstine will move with Mr. Pfeiffer to Logan, and he will become superintendent of the plant.

THE SEWER PIPE MEN TRYING TO GET TOGETHER.

Members of the board of directors of the American Sewer Pipe Co. were not successful, at their meeting held in New York, in effecting an extension of the selling pool for another three years. The annual meeting of the company will be held in Jersey City Feb. 1. It will be preceded by another meeting at which efforts will be renewed to effect the extension of the pool. On this point, George R. Hill, of this city, one of the directors, said last evening:

"The pool has not yet been effected but I have no doubt it will be. We have succeeded in having it extended for another thirty days. It may take several more meetings to effect the pooling agreement but there is the best of reasons for believing it will be effected, and that is that neither the American nor the independent companies are desirous of going into the open market on a ruinous competition."

In the last six months American Sewer Pipe stock has taken a jump of 13 points—from 20 to 23—and this was taken to mean one of three things—that the pool had been effected, that the dividend at the annual meeting in February would be increased, or that the independent companies were about to join the combine. As it is now the combine controls 60 per cent of the concerns of the country, the other 40 per cent being independent. The Robinson Clay Product Co., the Buckeye and Summit Sewer Pipe companies of this city and the Granite Clay Co. of Mogadore are those in this vicinity which are not in the combine.

Mr. Hill stated that no negotiations are on between the combine and the independent companies further than the formation of the selling pool and that he knew of no intention on the part of the independents to join the combine. He attributed the jump in the price of Sewer Pipe stock to the efforts of brokers in Pittsburg.

CHANGES WERE MADE IN DIRECTORS OF BARBERTON CO. AT ANNUAL MEETING.

Several changes were made in the board of directors of the Barberton (Ohio) Pottery Company, at the annual meeting held last week. The result of the annual election was not given out until Friday. The directors elected were: O. C. Barber, M. O'Neil, A. W. Blackburn, J. Ed. Good, H. B. Camp, John McNamara, W. A. Johnston, L. C. Miles, H. B. Manton and H. K. McLauren. Officers will be elected by the board of directors at a meeting next week. No changes were made in the stock of the company, nor in the plant last year, and no improvements have been decided upon for this year.

BRITISH COLUMBIA FIRE CLAY STANDS TEST.

The Messrs. McClure Brothers, Vancouver, B. C., have discovered and acquired another large area of blue clay near their first find at Matsqui, B. C. Experiments have been going on for the past month to determine its endurance against fire. The tests have been most satisfactory. The Matsqui brick was put alongside the best imported fire brick in a chemical furnace. The greatest heat that could be obtained was 3,600 degrees. At that temperature the English brick showed signs of vitrification, but the British Columbia brick was still as solid as when put into the furnace.

LIME OR SAND BRICK OR BLOCK NEWS.

H. G. Browning, Havana, Ill., will manufacture cement brick and blocks.

The Ft. Wayne (Ind.) Cement Stone Co. has been incorporated with $5,000 capital stock. Julius Remus is the manager.

Thos. J. Toner of Worcester, Mass., is trying to get up a $25,000 company at that place to make pressed cement building brick.

The United States Brick Corporation of Detroit, Mich., are again at work on the organizing of another sand brick plant at Michigan City.

The Aberdeen (Miss.) Sand-Lime Brick Co., with $70,000 capital stock, is now a surety as nearly all of the stock has already been subscribed.

The Genessee (Pa.) Sand Lime Brick Co. recently held their annual meeting and re-elected the old officers. A new sand dryer will be put in.

The Saginaw (Mich.) Pressed Brick Co. has increased its capital stock to $50,000, and will greatly increase the capacity of their plant at Carrolton.

Prominent business men of Owensboro, Ky., recently met in the office of E. W. Smith and informally discussed the building of a sand-lime brick plant.

The Warsaw (Ind.) Sand Brick Co. have received another lot of samples manufactured from Warsaw sand. They expect to get started about the 1st of April.

The Cape May Sand Co., Cape May, N. J., has been incorporated with $35,000 capital stock. Incorporators, E. W. Lloyd, J. H. Edmunds, Frank Entrikin and Wm. S. Van Zant.

The Federal Granite Brick Co., Scranton, Pa., are planning to put up another sand-lime brick plant and locate it at Sayre, Pa. The capital stock has been increased from $35,000 to $100,000.

The Indiana Sand-Lime Brick Co., at North Judson, Ind., is progressing nicely, contracts for the erecting of the necessary buildings have been let and practically all the machinery has been selected.

The builders of the sand-lime brick works at Houston, Texas, will have the plant in operation in March, and arrangements have been made to build a plant at Tampico, Mexico, by the same parties.

The American Press Brick Co., Michigan City, Ind., has already made plans for the enlarging of their sand-cement brick plant. The plant will put in some new machinery. George L. Smith is the manager.

The German-American Brick Co., Tampa, Fla., has been incorporated with $25,000. J. M. Towne is president; Geo. H. Travers, vice-president and secretary, and Gustave Loeffler, general manager and treasurer.

The American Hydrating Co., Baltimore, Md., and Delaware, Ohio, have put on the market a splendid hydrating machine which should interest all sand-lime brick manufacturers. See their ad on page 49 of this issue.

The Diamond Brick Co., Muncie, Ind., has been incorporated with $40,000 capital stock, and will build a sand-lime brick plant at once. B. W. Bennett is president; Lee M. Glass, vice-president; Harry Wolf, secretary, and Leo S. Ganter, treasurer.

The Youngstown (O.) Artificial Stone and Construction Co. has been organized with $25,000 capital stock. The officers are W. E. Leedy, president; John F. Hynes, vice-president; John F. Cantwell, secretary and treasurer, and Timothy Beehan, manager.

MISCELLANEOUS ITEMS.

The Colonial Pressed Brick Co., Akron, O., increases its capital stock from $30,000 to $50,000.

The Greiner Brick Co., Waupaca, Wis., is ready to be incorporated. They will enlarge the present plant.

The Chicago Tile Roofing Co., Prospect Hill, St. Louis, Mo., increases its capital stock from $25,000 to $31,000.

A. DeLatteaud and A. LaGrange, of Crawley, have bought the W. P. Dunn & Co. brick yard at Lake Charles, La.

The Krummel & Buechner Fire Clay Co., St. Louis, Mo., has been incorporated by Wm. Krummel, Wm. Buechner and others.

The Pee Dee Brick Co., Mullins, S. C., has been incorporated with $5,000 capital stock, by J. B. Blackman, W. H. McMillan and P. S. Cooper.

J. P. Burkholder has transferred the New London (Iowa) Brick and Tile Factory to A. Totemeier, and will move to a farm in Van Buren County.

A company of capitalists composed of J. C. C. Mayo, Watson Kent Pritchard and others have taken options on 3,000 acres of fine clay lands in Carter County, Ky.

John Strain and Robert Chrissinger have bought a tile factory located 2 miles northwest of Mt. Pleasant, Iowa, and will move their families there within a few weeks.

The Corono (Cal.) Pressed Brick & Terra Cotta Company is contemplating increasing their plant to a great extent. Orders have already been given for dry and wet pans.

The Diana Brick & Tile Co., 228 South Peters street, New Orleans, La., will increase their capital stock from $75,000 to $100,000. Their brick plant is near Beaumont, Texas.

The Scandia Brick & Tile Co., Des Moines, Ia., filed an amended article increasing its capital stock from $10,000 to $30,000. A. C. Carlson is president and Henry Beckman secretary.

The Overton Pressed Brick Co., Tacoma, Wash., will be incorporated with $10,000 capital stock, by William Overton, Byron Barlow, R. F. Radebaugh, Richard Overton and H. E. Anderson.

The Britton (Mich.) Brick Co., capitalized at $100,000, is to be organized at once and a $40,000 plant built. The company owns 100 acres of land. Deerfield and Ann Arbor men are the stockholders.

The Bluff City Brick Cmpany, Pine Bluff, Ark., are now making 18,000 fine brick daily, but within a short time will install additional machinery to greatly increase the output. Mr. O'Neal is the manager.

Geo. W. Cosdon, A. B. Cameron, Daniel Kline and Geo. W. Craig, North East, Md., have organized a new fire brick works and have bought the McCullough Iron Works plant to convert into a brick plant.

The Capital City Brick Co., Columbus, O., has sold to William H. Alkery, trustee for Sessions & Co., the brick works on the south side of Fifth avenue for $45,000 and 27 acres of land in Marion township.

Active preparations are on foot for the remodeling of the Cuba (Ala.) Brick and Pottery Company's plant.

A large brick manufacturing plant in the East is in correspondence with Decatur, Ala., parties relative to locating there.

The Carey Brick Company, Mechanicsville, N. Y., recently held their election and declared a 10 per cent dividend on its capital stock.

The interest of Samuel Makepeace in the Troy (O.) Brick & Tile Company has been purchased by Edward and Rijah Wilson.

Walton & Company, Jacksonville, Ill., have leased the Whimer brick yard and will operate it. The plant has a daily capacity of 30,000 brick.

The Indiana Drain Tile Company will begin very shortly to build their large drain tile plant at Brooklyn. They are capitalized at $100,000, and J. M. Powell, of Orestes, is the president.

C. D. Ritchey, Rushville, Ill., has sold his brick and tile works to Baldridge Bros., of Stonington. They recently sold their plant at the latter place. Mr. Ritchey will go to New Mexico for his health..

The new officers of the Portland (Ind.) Tile & Hollow Block Works include J. L. Fulton, president; J. A. Long, vice-president; W. C. Hoover, secretary-treasurer, and Warren Overpack, manager.

The Eureka Pressed Brick & Floor Tile Company, Des Moines, Ia., has been incorporated with $35,000 capital stock. L. E. Bennett is secretary and manager. The company has a plant in Sevastopol.

The Perrysburg (O.) Tile & Brick Company reorganized with the following officers: George Munger, president; A. J. Witzler, vice-president and manager; C. H. Hoffman, secretary, and A. J. Roether, treasurer.

Negotiations have been completed for the consolidating of the Columbus (O.) Contractors' Supply Company and the Franklin Brick Company, under the first name. The capital stock will be $250,000. Daniel McGrath is the president.

Wm. H. Maybury, Department of Public Works Commissioner at Detroit, Mich., is advertising for bids to build a 20,000 and a 30,000 daily capacity paving brick plant on land furnished by the city, also advertising for shale to be delivered to this plant.

The Minnesota Ceramic Company, St. Paul, Minn., has been incorporated with $150,000 capital stock, by James J. Smart, of St. Paul; F. D. Kendrick, of Bismarck, N. Dak.; C. B. Little, Bismarck; Wm. H. Egan, of St. Paul, and Fred A. Defid, of St. Paul.

The Perryville Sand & Clay Company, of Perryopolis, Pa., has been bought by Monessen capitalists and reorganized into a $75,000 concern, known as the Perry Clay & Manufacturing Company. The officers are C. F. Eggers, president; W. Reynolds, vice-president; J. G. Jones, treasurer, and John F. Torrence, secretary. A plaster and silica brick plant will be installed.

The Gainesville (Texas) Brick Company has increased its capital stock from $50,000 to $60,000.

The brick works of Hatch Bros., Camden, N. J., which recently burned down, will be rebuilt.

R. A. Rockhill, 307 Market St., Camden, N. J., is ready for bids for a brick plant for that place.

The sale of the United States Clay Manufacturing Company plant at Griffin, Ill., has been made for $42,424.

The Kewanee (Ill.) Mining & Manufacturing Company will rebuild their brick plant as soon as possible. The plant that was burned was insured for $70,000.

The entire plant and equipment of the Hall Brick Company, Detroit, Mich., will be sold January 31. Herbert W. Noble is the trustee, 304 Union Trust Building.

It is expected that the Barber Asphalt Company, Des Moines, Ia., will buy the plant of the Capital City Brick & Pipe Company, which it has held under lease for several years.

The Evans & Howard Fire Brick Company, St. Louis, Mo., elected the following officers: C. D. Gregg, president; Andrew Sproule, vice-president, and George W. Jones, secretary.

The stockholders of the Johnstown (Pa.) Pressed Brick Company have elected as officers: W. C. Krieger, president; George C. Jordan, vice-president; W. B. Thomas, treasurer, and J. H. Cunningham, secretary.

Birnamwood, Wis., is to have a brick yard called the Birnamwood Brick Company. John Carlson is president, William Schmidt, superintendent and manager, and L. W. Boettcher, secretary and treasurer.

A. C. McGillivray, register of the land office at Dickinson, N. Dak., has made a contract with two men from Iowa to install a modern brick making plant. The first season they will confine themselves to building brick.

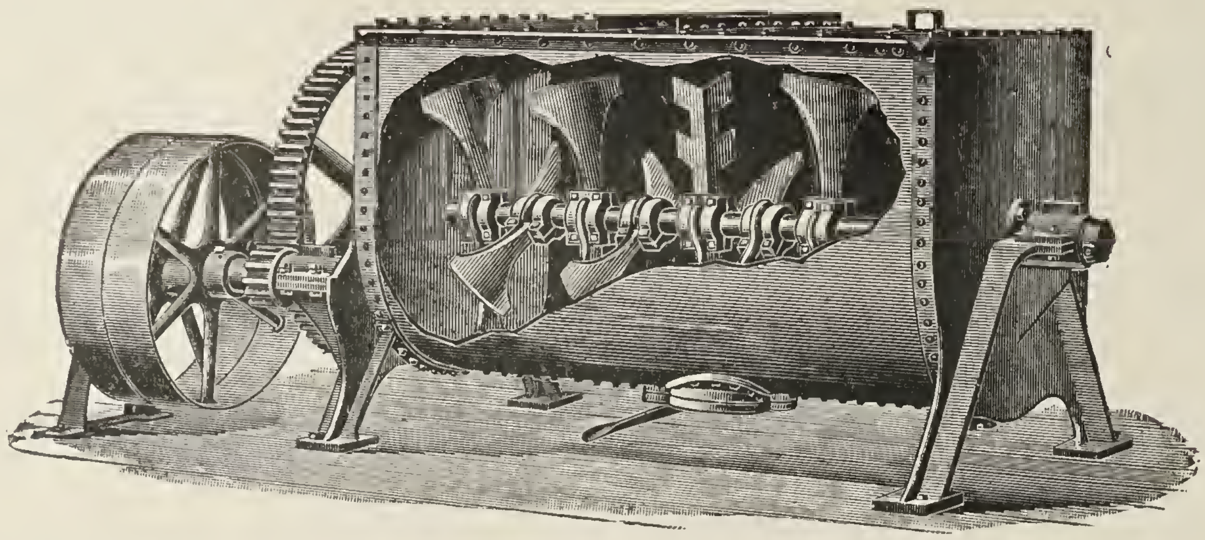
The plant and business of the Hocking Clay Manufacturing Company, of Logan, O., has been taken over by the Logan Clay Product Company, which is composed of Akron capitalists. Jacob Pfeiffer is president and general manager.

The Buckeye Fire Brick Company, Scioto Furnace, O., elected at their annual meeting the following officers: T. C. Moulding, president; John Richardson, vice-president; Henry Prescott, secretary, and E. P. Stevens, treasurer and manager.

The Park Brick Company, of West Hartford, Ct., has filed a certificate of organization. Hartford parties have the controlling interest. George H. Toord holds 108 shares, and Henry L. Thorpe 49, out of 210. The latter is president and the former secretary and treasurer.

The Wisconsin Portland Cement Company, with $750,000 capital stock, will build a Portland cement plant near Portage. Dr. S. M. Babcock, of the University Agriculture College, Madison; Joseph M. Boyd, cashier of the Bank of Wisconsin, and F. H. Merrell, of Portage, are interested.

At the directors' meeting of the Coon Creek Coal Company, at Clinton, Mo., it was decided to put in a paving-brick plant this coming summer. The directors are Haugeberg & Olson, of Clinton; Dr. Pettigrew, of Sioux Falls, S. D.; F. H. Morrison, of Esterville, Ia., and Phillip Ridgeway, of Lenox, Iowa.



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COLORING

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A party thoroughly acquainted with the trade in the Southeast, Southwest Kansas and Missouri territory. Must be a good salesman. Take charge of the sales department of a concern manufacturing cement plaster, lime and vitrified brick. Best reference from past and present employers required.

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Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

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Good Brick and Tile Factory. Good clay, good railroad facilities, and good field especially for tile.
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50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets Track gauge 25 Inches.
Both styles of cars in first-class repair.

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A second hand No. 2 Giant Auger Brick Machine. Address "GIANT,"
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1 Raymond Victor double die steam repress.
1 Raymond Columbian double die steam repress.
1 American Clay Working Machinery Co. Eagle double die steam repress.
3 Bonnot double die steam represses.
2 Penfield single die steam represses.
1 four-mold Boyd Dry Press, new.
All in thorough repair.

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$200.00 buys a Freese Combined Brick and Tile Machine and Pug Mill. Dies, Tables, complete, No. 1. Good order.

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One C. W. Raymond Co. No. 777 Brick Machine, with automatic down-cut cutter. Machine is in perfect condition; has only made one-half million brick.

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HERE IS THE REMEDY.

PRECIPITATED

Carbonate K.B. C.F.H. **of Barytes**

The only preventative for scum and discoloration on facing Brick and Terra Cotta; neutralizing the Sulphate of Lime in the Clay and Water.

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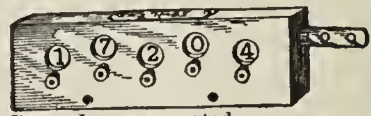

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4 Wheel, $3.00
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Guaranteed.
Sold by all dealers.

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A SPLENDID OPPORTUNITY.

A well-equipped brick yard, 24 miles from one of the best cities in the South which uses from six to eight million brick per year. One of Chambers Bros. large size machines, and disintegrator with pugging machine, two boilers and 80 h. p engine. 85 acres of land. Will sell all or a one-half interest. One-third cash, balance in brick at $5.00 per thousand at yard, as owner is a contractor. Address

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A Four-Mold Simpson Press Brick Machine, in good condition, at your own price. Address

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One Potts Disintegrator.
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All for $350.00 to a quick buyer.

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Brick and Tile Mill, Ohio made, in good order. Address

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Waste Heat Dryers and Up and Down Draft Kilns a **Specialty**.

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Automatic from Begining to End

The only requisite being the weighing of each wheelbarrow of lime before dumping it into the machine.

The HYDRATOR, as the machine is called, will do the rest.

No grinding, no separating, no free lime.

The lime as it comes from the kilns is fed the machine, the powdered hydrate—freed from all impurities, flows from the discharge end.

The process is continuous.

The capacity from one to ten tons per hour, depending upon size of machine.

Especially adapted to sand-lime brick manufacture.

SEND FOR ILLUSTRATED CATALOGUE.

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Baltimore, Md., or Delaware, Ohio.

A CARD TO THE BUILDING TRADE.

COPY OF ADD IN MUNICIPAL ENGINEERING, OCTOBER, 1904.

"We shall be pleased to meet you at our exhibit, Block 11, Mines and Metallurgy Building. Universal Exposition, St. Louis, where we can show you our NORMANDIN BLOCK MACHINE in detail. Our *Mr. W. W. White* is in charge assisted by our machine expert and demonstrator *Kirk H. Brown*; don't fail to call."

(Signed) Cement Machinery Co., Jackson, Mich.

COPY.

Circuit Court ot the United States, Eastern District of Missouri.

HARMON S. PALMER HOLLOW CONCRETE
BUILDING BLOCK COMPANY,
Complainant,
vs.
WILLIAM W. WHITE AND KIRK H. BROWN,
Defendants.

FINAL DECREE.

It is ordered, adjudged and decreed as follows:

1. That letters patent of the United States to Harmon S. Palmer, No. 727,427, 727,428 *Dated May 5th, 1903*, and 731,323 *Dated June 16th, 1903*, are good and valid patents * * * *.

3. That the Harmon S. Palmer Hollow Concrete Building Block Company, Complainant named in the Bill of Complaint herein, is the owner of all right, title and interest in and to said letters patent.

4. That the defendants herein, WILLIAM W. WHITE and KIRK H. BROWN, have infringed said letters patent * * * * and upon the exclusive rights of Complainant, HARMON S. PALMER HOLLOW CONCRETE BUILDING BLOCK COMPANY by making and USING machines embodying in their construction and method of operation the inventions covered by each of said letters patent.

6. That a perpetual injunction issued out of and under the seal of this Court, directed to defendants, the said WILLIAM W. WHITE and KIRK H. BROWN, their attorneys, clerks, agents, servants and workmen, and all claiming under or through them enjoining and restricting them and each of them from directly or indirectly making, USING or SELLING, machines * * * * embodying or employing said inventions claimed and patented by said patents, * * * *.

7. That Complainant DO RECOVER from said Defendants, WILLIAM W. WHITE and KIRK H. BROWN, the costs in this case, to be taxed, and that said Complainant have execution therefor against said Defendants.

(Signed ELMER B. ADAMS, Judge.
November 15th, 1904.

In view of the denial by the Normandin people that the Palmer Company had secured an injunction as claimed, and the further fraudulent claim that they owned certain interest in the Palmer Patents under a contract dated November, 1900, we deem it proper to inform the public, that neither W. F. Cowham, N. S. Potter or the Cement Machinery Company, own or control any portion of the H.S. Palmer patents. The paper referred to in their advertisement was an old option given at the time they bought one of the Palmer machines. The option was for thirty days and was never exercised, and was given to a proposed company which was never formed. The patents infringed by White and Brown, on the NORMANDIN machine were dated about three years later, May 5th, 1903.

HARMON S. PALMER HOLLOW CONCRETE
BUILDING BLOCK COMPANY,
Washington, D. C.

Automatic Improved DRYERS

ECONOMICAL—EFFICIENT—GREAT CAPACITY

For Clay, Coal, Sand, Marl, Etc.

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We have designed, built and reconstructed twenty two Cement Plants in the past twenty years

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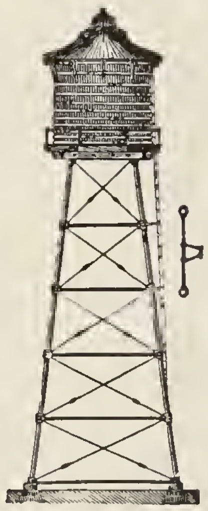

Absolutely safe and reliable. *Ask your friends*

A WOODEN TOWER

Is a source of annoyance and danger. It is liable to rot and collapse at any time. A

CALDWELL STEEL TOWER

is safe, staunch and durable and will carry four times the weight of the filled tank. Expensive labor is not necessary to erect these outfits, your own men can do it. We furnigh all plans.

Send for illustrated catalogue and price list.

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How to Use Portland Cement.

From the German of L. Golinelli.
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A booklet of 30 pages, 5½x6½ inches.

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FIRE! FIRE!! FIRE!!!

THE "UTICA"
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Without rubber hose is the

BEST AND SIMPLEST
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Weight No. 2 loaded only 22 Lbs.

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Brick Moulds and Brick Barrows

With Moulds and Barrows it is not the first cost, but it is, will they last? We have made them for over 30 years and know your wants. All kinds and shapes. A trial order will convince.

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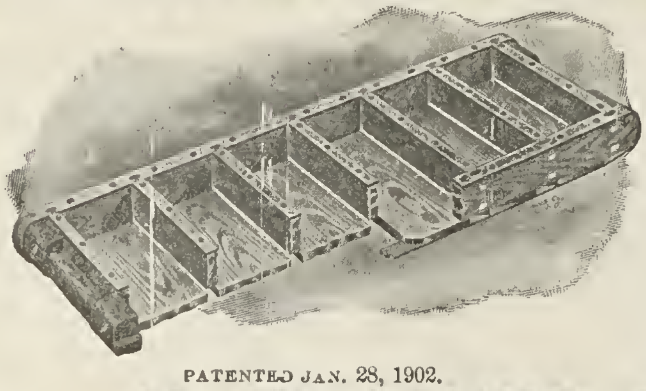

These are the kind of Brick Moulds the Brick Makers have always wanted but could not get till now. You can get a mould that the vents are right all the time No change whether the Mould is wet or dry. Try a sample order. Satisfaction guaranteed.

PATENTED JAN. 28, 1902.

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Manufacturers of Brick Machinery and Supplies of all Kinds. **NEW LONDON, OHIO.**

The New York State School of Clay-Working and Ceramics

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Instruction given in the SCIENCE, TECHNOLOGY and ART of the CLAY-WORKING INDUSTRIES, BRICK, TILE, TERRA-COTTA, WHITE WARES, ARTISTIC POTTERY and PORCELAIN.

Tuition free to residents of the state of New York.
Catalogue sent on application.

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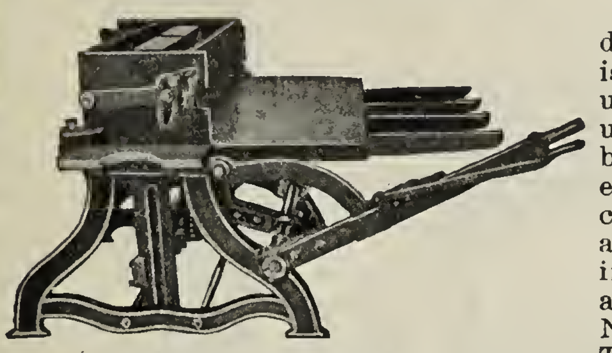

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Get equipped with a Normandin and don't be handicapped, as this machine is complete and practical. Hundreds in use, thousands of Normandin Blocks used daily. Cheaper and better than brick or stone. The U. S. Government engineers, and the leading engineers, contractors, builders, cement workers and railroads have adopted and are useing the Normandin because it's right and superior to all others. **Investigate.** Normandin Blocks are in demand. Their manufacture is a permanent and profitable business

GROUP OF NORMANDIN BUILDING BLOCKS.

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HOT FLOOR DRYING AND HEATING SYSTEM.

Heat your buildings, dry house, brick machine room, crusher room, engine room, or anywhere by the use of your waste steam from your engine and pumps. This can be done by our system of **HOT FLOOR HEATING** at about the cost of ordinary wood floor, and there is no pipes to buy, no nightman to pay, no coal to burn. We will furnish plans for the Hot Floor Heating System at small cost, and any man can put same in working order. Our 25-horse power engine will furnish heat from the exhaust steam while doing its own work for double the heating floor that is needed for the capacity of 25-horse power. Other sizes in proportion. Patent applied for. It costs you nothing for heat and you can run the year around. Address

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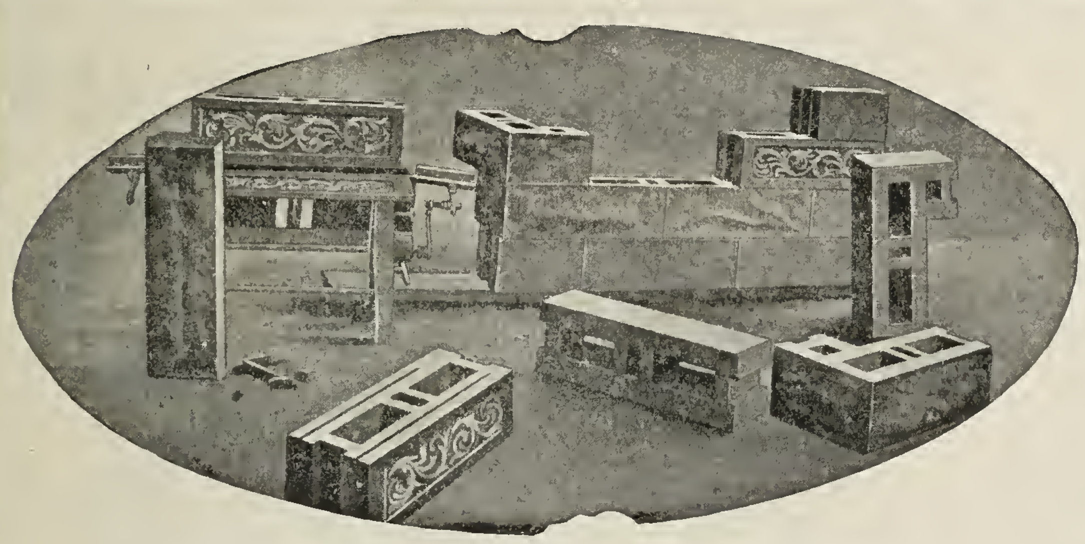

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DON'T BUY IMITATIONS and be subject to injunctions. The U. S. Courts have given us injunctions against **FOUR DIFFERENT PARTIES** and sustained the validity and ownership of our patents.

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Hundreds of papers in different towns are giving us unsolicited praise for the **national economy of our invention,** which others would be glad to appropriate.

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When You Can Buy Ready Made Cheaper?

SEND FOR SAMPLES AND PRICES.

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The Lehigh Valley Railroad Co. is about to open a new territory in the New Jersey Clay Belt. Very desirable locations are offered to manufacturers of Clay and Kaolin products.

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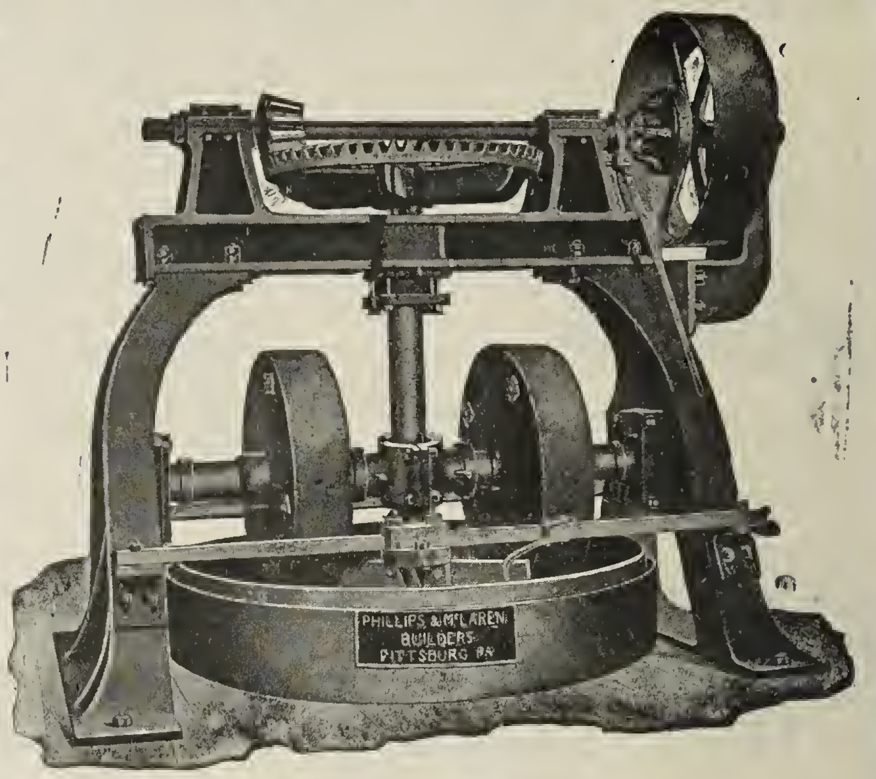

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Tell us kind of material and capacity you have and we will quote you accordingly. We make **CRUSHERS** also.

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A correspondent in a good Alabama town desires a man to take charge of an up-to-date Brick Plant. It is in a section of country which will readily take the entire product.

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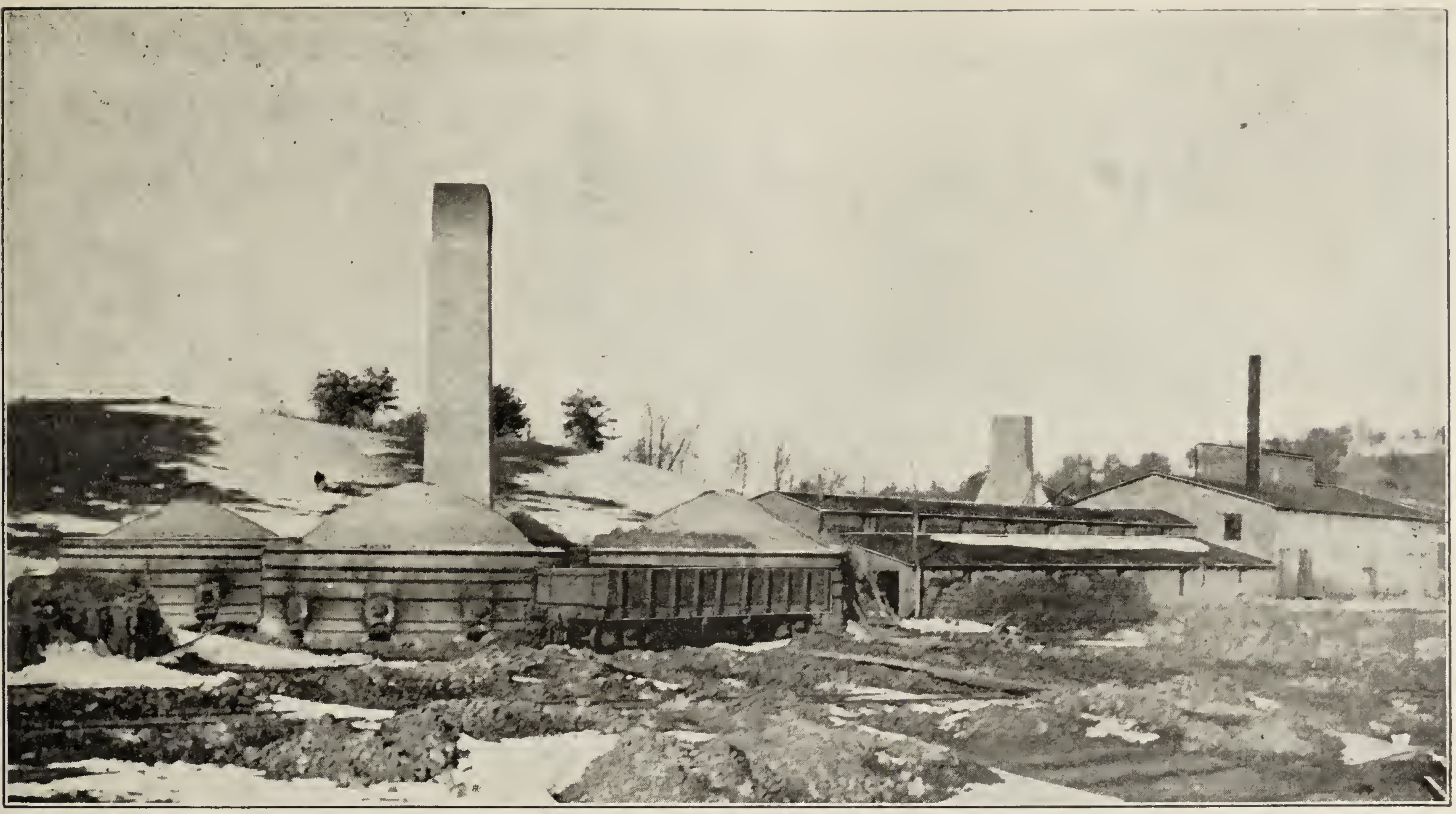

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The above plant is located on the C. & N. W. R. R. and has its own side track. It owns 20 acres of shale clay and fire clay and the clay on top of the shale is used to make drain tile. The shale clay makes a fine mottled face press brick and crossing and sidewalkbrick. At the present time we are unable to supply all the orders for pressed brick. The machinery consists of one 4-mould Simpson dry press, one 8-foot dry pan with elevator and track to clay bank to convey clay direct to chute connected with dry pan, one 65 h p. slide valve engine 14x24, one 80 h p. 60x16 full front, one hot water tank and steam pump, one Brewer tile machinery and crusher, 4-track hot air tunnel dryer and 50 dry cars, and single and one double transfer car. 8-foot fan driven from 15 h p. engine to take the waste heat from the cooling kiln to dry the brick or tile, also one hot floor dry house 44x108 feet heated with exhaust steam from engine to dry the tile, and 4-round down draft kiln 24 feet inside with 55 foot stack in the center This is the only plant in town and there is a home market for all the tile it can make. There is also always a good demand for press brick. The reason for selling is poor health. It will pay you to investigate. Address

F. W. HEIDENREICH, Iowa Falls, Iowa.

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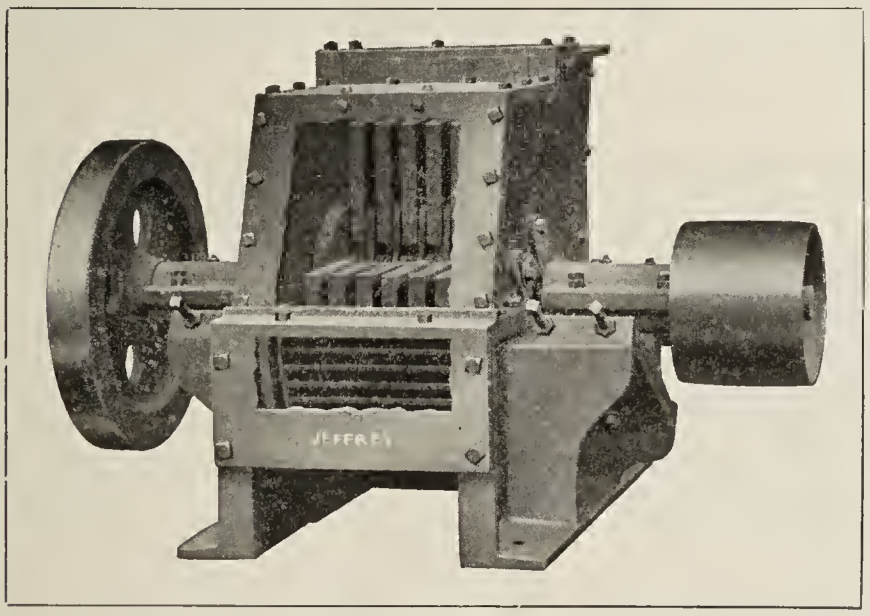

SUCCESSFULLY CRUSH

SHALE, LIMESTONE, BRICKBATS,

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A Few Features that Place

JEFFREY PULVERIZERS IN THE LEAD.

Accessibility of Working Parts, Substantial Pillow Blocks, Simplicity in Changes of Parts, Material Partly Crushed in Suspension.

Catalogue 30 on Pulverizers Mailed Free.

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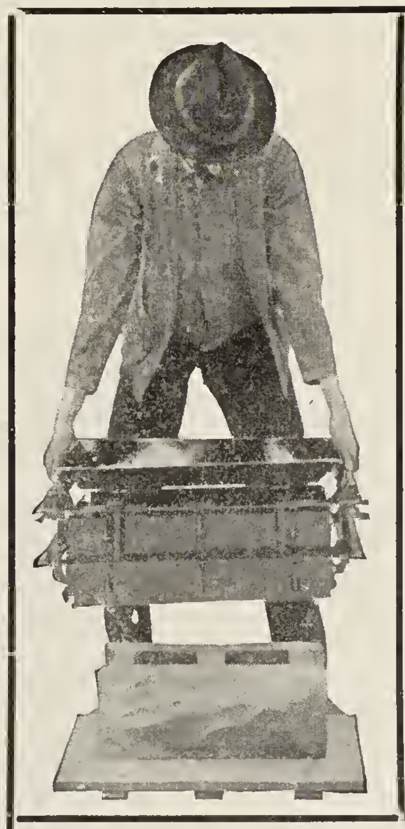
Elevating-Conveying-Power-Transmitting Machinery.



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Add a Stone Factory to Your Brick Plant?

Change Your Idle Days from a Loss to a Profit.

OUR PORTABLE HOLLOW CONCRETE BUILDING BLOCK MACHINE

Is the BEST, FASTEST, SIMPLEST and CHEAPEST on the market.

1 Man Can Make 200 Blocks Per Day

No carrying off blocks, consequently no loss by breakage, no expensive iron pallets, no cogs, gears, springs or levers, but it does the business.

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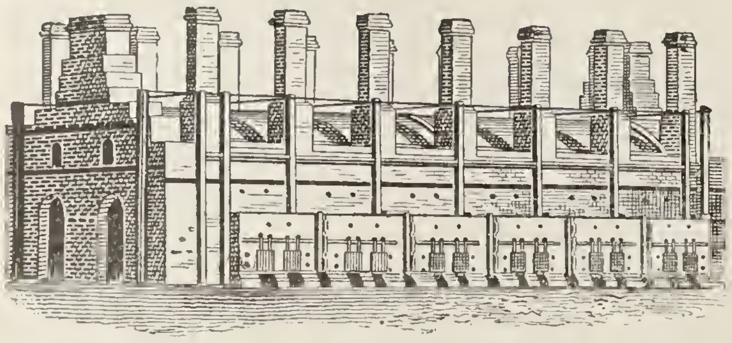
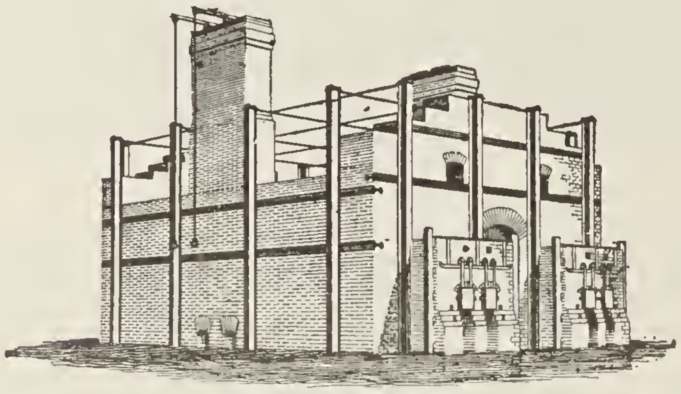


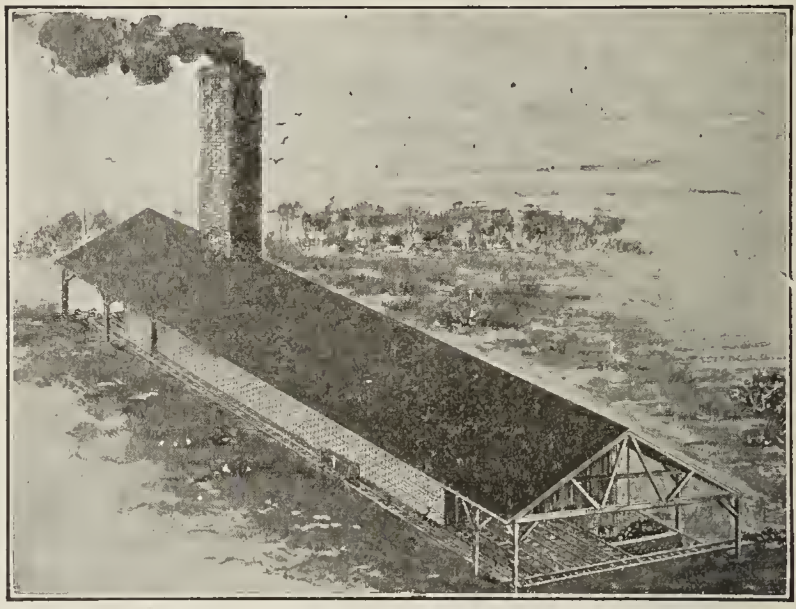
Improved Kilns, Square, Round and Continuous, End or Side Fire, Hot Air and Steam Tunnel Dryers, Steam or Hot Air Dry Floors, Test Kilns any Size.

REPRESENTATIVES WANTED.



Build the best; it is the cheapest in the end.

Hot Air or Waste Heat Dryer.



Brickmakers' Engineers.

Designers and Builders of Brick Plants.

Wilson Kiln & Dryer Co.

THOS. M. WILSON, Manager.

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Erie Railroad Chicago to New York

The Erie Railroad Company's Industrial Department has all the territory traversed by the railroad districted in relation to resources, adaptability, markets and advantages for manufacturing, and can advise with manufacturers in relation to the most suitable locations. The information furnished a manufacturer is reliable and has practical bearing on the nature of his particular industry.

Vast deposits of anthracite and bituminous coal, oil, natural gas—fuel is the paramount factor in manufacturing—sewer pipe, fire and other clays, cement material, gypsum, building stone and numerous other resources exist on the line.

It is important in this age of modern facilities for manufacturers to locate where they can obtain side tracks so as to receive from and ship directly into cars at the factory. Information can be promptly furnished in this connection about every point on the system between New York and Chicago.

The undersigned will be pleased to furnish full information to manufacturers and local parties contemplating the establishment of new industries.

Address, **LUIS JACKSON**
Industrial Commissioner
Erie Railroad Company
21 Cortlandt Street, New York

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is the only semi-monthly.
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RESULTS GUARANTEED.

MANGANESE
FOR ALL USES.
LUMP, GRAIN AND GROUND
60-70% 70-80% 80-90% OXIDE.
CLAY WORKERS GOODS A SPECIALTY.
SAMPLES AND PRICES ON INQUIRY.
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AND
OTHER INDUSTRIES
ARE
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WITH
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ON THE LINES OF
THE ILLINOIS CENTRAL R. R.
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YAZOO & MISSISSIPPI VALLEY R. R.

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J. C. CLAIR,
Industrial Commissioner,
1 Park Row, Chicago, Ill.

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THE BEST MONEY-MAKER IN THIS COUNTRY TODAY.

Plants installed complete on the AMERICAN SYSTEM, equipped with AMERICAN MACHINERY, started and operated until 100,000 brick are made. Quality Guaranteed. No Failures. No Experimenting. No Royalties. No Secrets. No Chemicals.

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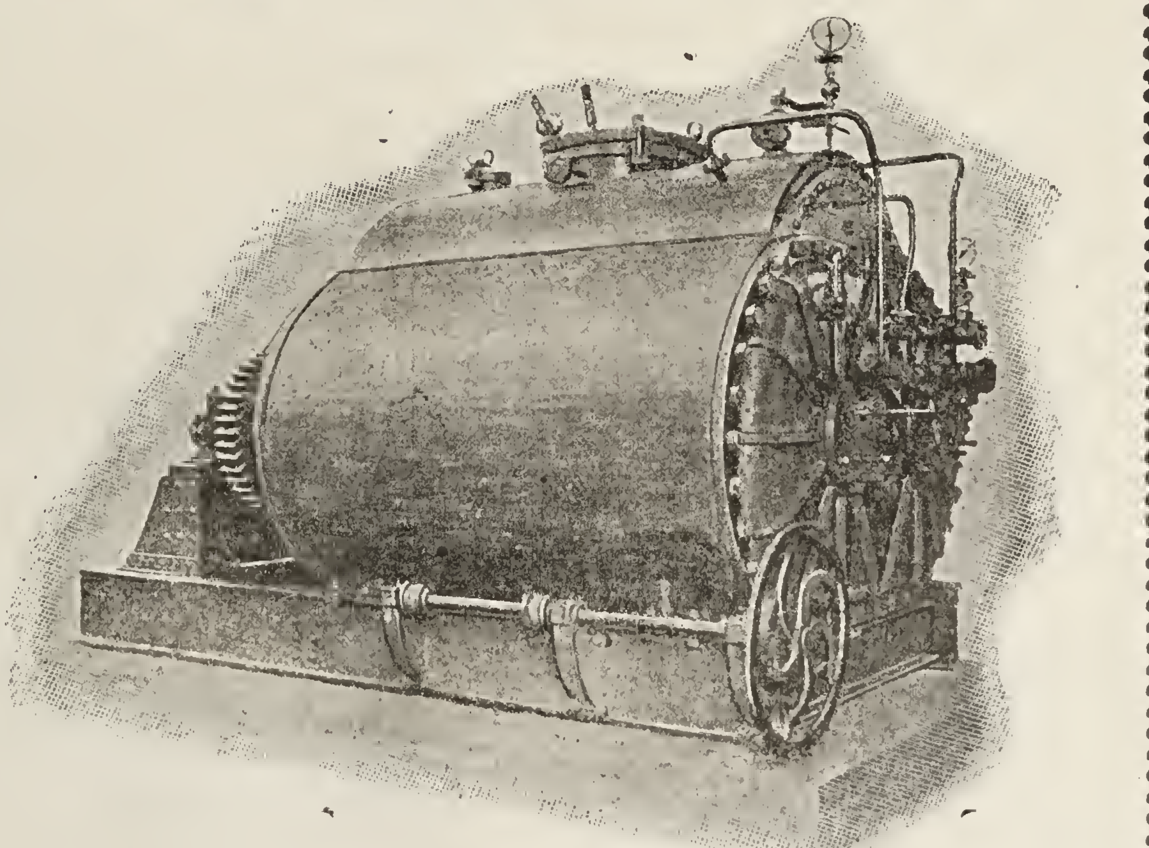
SAND-LIME BRICKS

Sand-Lime Brick Engineers
and
Builders of Special Machinery
for the Sand-Lime
Brick Industry.

Factories erected, equipped and put in running order under Full Guarantee.

We invite inspection of our plants.



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BRICK CO.**
8-10 Bridge Street :: NEW YORK

SEMISTEEL CO.

ENGINEERS AND FOUNDERS

701 New England Building

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TALLEST SAND-LIME BRICK BUILDING IN THE U. S.
BRICK MADE ON OUR SAMSON PRESSES.

Sand-Lime Brick

Plants Erected of any Capacity

Have you any Sand?

If so, you need what we have.

Our System is used by the first Sand-Lime Brick Plant in the United States, and has been in continuous operation and has produced and sold more brick than any other single plant.

Send for information. We have equipped plants in all parts of the United States. We do not use cement or chemicals, and do not sell patent rights.

SEND FOR FREE BOOK.

We are not brokers, but operate our own foundry and machine shop.

WE MANUFACTURE

- Special Sand Brick Presses
- Hardening Cylinders
- Sand Mixers
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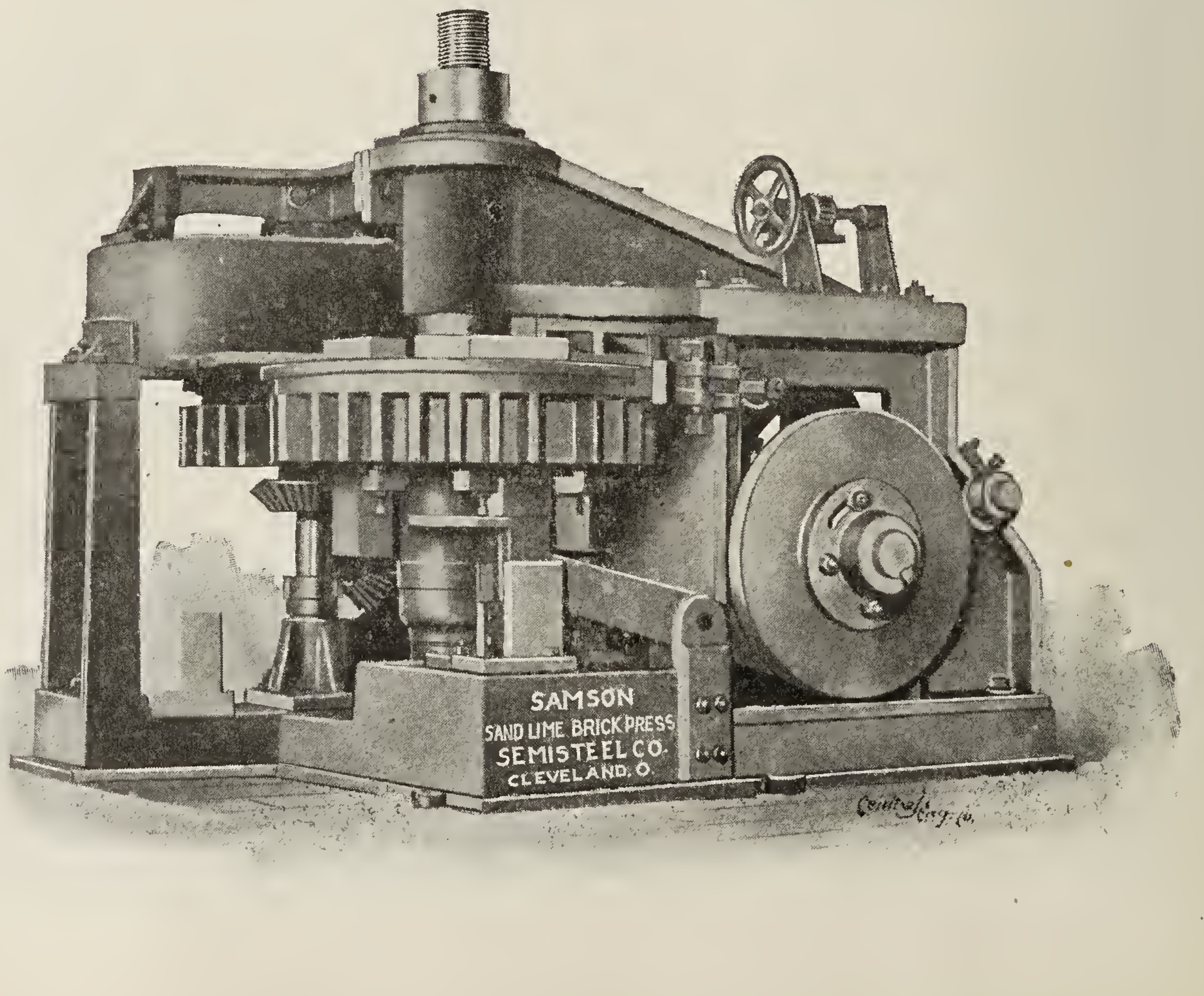
- Conveying Machinery
- Brick Cars, Transfer Cars
- Elevators
- Steel Castings
- Manganese Steel
- Cast Iron, Nickel Steel

SEMISTEEL CO.

701 New England Building

CLEVELAND, - OHIO



"Huennekes System"

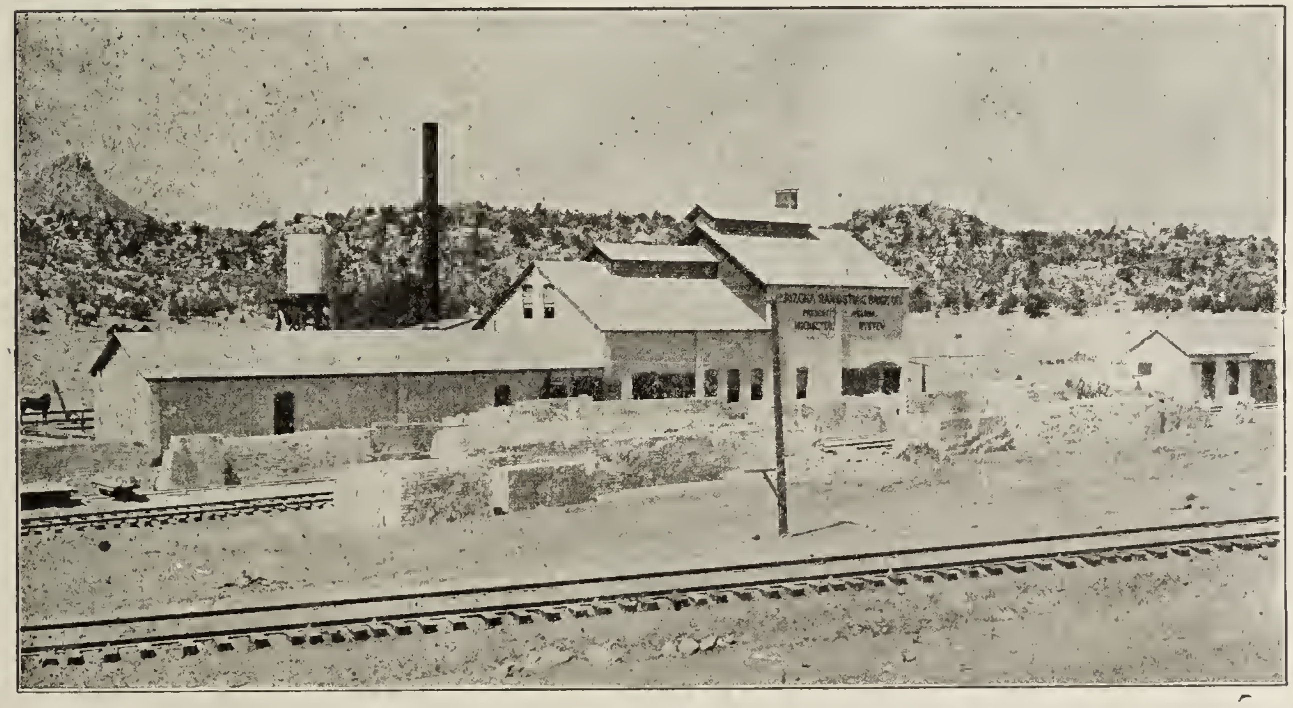
SAND-LIME BRICKS AND BLOCKS

25 Factories Designed, Equipped and Set in Operation During the Past Year in the United States and Canada.

OUR RECORD: Combined capacity of factories in 1903, 15 million bricks per annum.
Combined capacity of factories in 1904, 150 million bricks per annum.

Received from the Jury of Awards at the Louisiana Purchase Exposition the highest award for excellence of sand-lime brick.

U. S. Company's Quarters Whipple Barracks, Prescott, Arizona, Erected Out of "Huennekes System" Sand-Lime Bricks



[Factory of the Arizona Sand-Stone Brick Company, "Huennekes System" Prescott, Arizona, Finished in Bricks of Their Own Manufacture.

"THINK THIS OVER."

Before the expiration of this year the total combined capacity of the factories erected and operated under the "Huennekes System" will be about 300 million bricks per annum—or a growth of about 2,000 per cent in one year.

Remember the doubts and scoffings about the "dry pressed brick" but a few years ago and the money made by the pioneers in this business.

The Sand-Lime Brick Business is to day in the identical state as the dry pressed brick business was but a few years ago.

All of our special machinery is manufactured in the United States by the foremost machine shops in their particular line of business, and are thoroughly tested, insured and guaranteed before leaving shops. All special machinery, as well as our methods and process are fully protected and covered by United States Patents. **Without the use of the same it has proved impossible to produce a high grade brick out of sand and lime in a commercial way at a low cost. The rapid growth of our business from 15 million brick per annum in 1903 to 150 million brick per annum in 1904** is not only a proof of the merits of the "Huennekes System." but also of the product itself.

Send for free booklet, tests and testimonials.

The original, oldest and only experienced Engineering Firm in the Sand-Lime Brick Industry.

H. HUENNEKES COMPANY

Engineers and Contractors for the
Erection of Sand-Lime Brick Factories.

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SHALE FIRE CLAY

OUR SUBJECT

MACHINERY

Covers a line of **PRESSES** and **PANS** for making

SEWER PIPE FIRE PROOFINC DRAIN TILE

Also Tuyeres, Sleeves, Nozzles, Runner Brick for Bessemer Steel process.

Write for prices stating your requirements.

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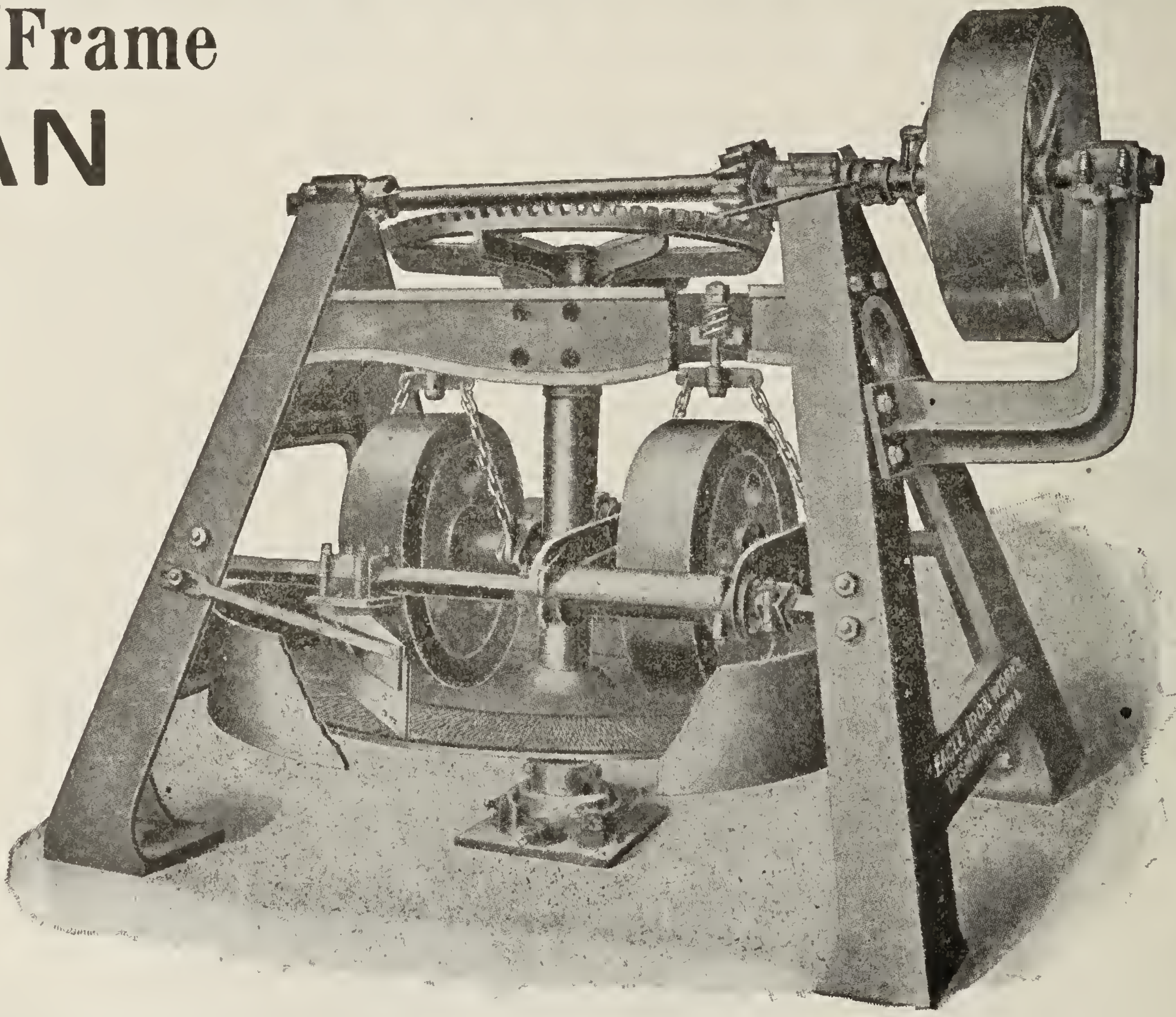
DRY PAN

With Independent and Suspended

MULLERS

A well-tried and proven Success.



EAGLE IRON WORKS, BUILDERS, DES MOINES, IOWA

ORDERS FOR PERFECT CLAY SCREEN

are proving our claims, as our record of sales for one week are fifteen screens. Thirteen of these were for old customers while two were for new ones. If our old customers were so well pleased, why can we not do as much for you?

If you use a screen we claim we can save you money by using ours.

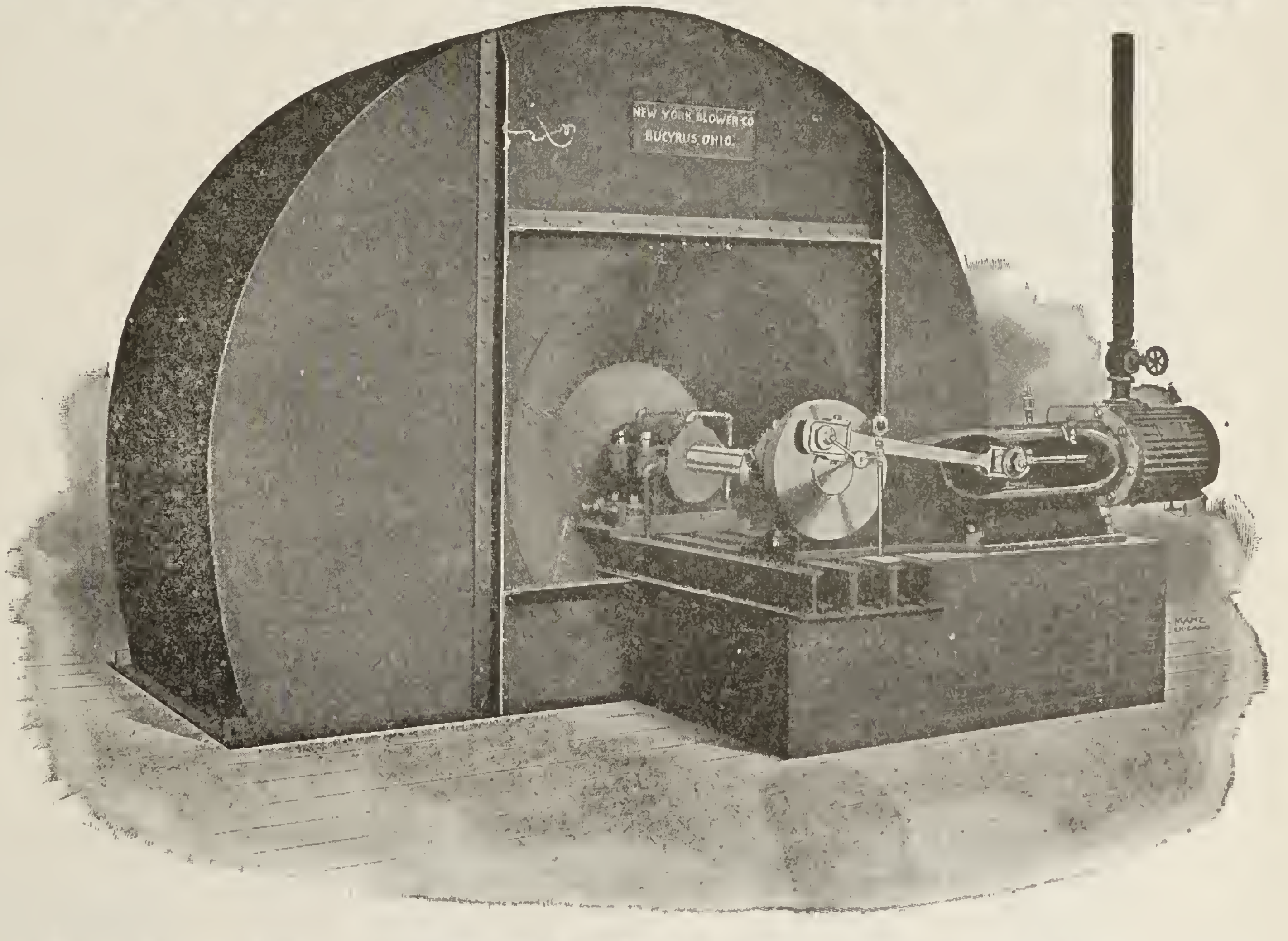
DOES NOT THIS RECORD OF SALES PROVE OUR CLAIM.

We guarantee satisfaction, let us show you what we can do. Our new catalog for the asking.

DUNLAP MFG. CO.,
BLOOMINGTON, ILL.

WASTE HEAT CLAY DRYER.

We offer the New York Blower Company's Improved Waste Heat Dryer as the most successful means of utilizing the heat from the cooling kilns which is at present an absolute waste. The two important factors in drying are heat and circulation of air; one being as important as the other. These are both amply provided for in our dryer. By the use of mixing chamber, provided with the proper dampers fresh air can be admitted to the fan to reduce the temperature of the incoming gases to the proper degree. By changing the speed of the fan the amount of air blown into the tunnels is easily regulated. With this apparatus, by which you can readily regulate and control the heat and circulation, you have a dryer which will work successfully in all climates and temperatures. The necessity of perfect circulation in a dryer should never be overlooked. With this end in view we provide additional circulating devices in our largest dryers. This maintains an even and positive circulation throughout the dryer and insures the successful drying of your brick.



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Cathedral Corner, Fennel Street,
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NEW YORK BLOWER CO.
BUCYRUS, OHIO.

THE BRICK MAN

who makes a success of his business is the one who is always alert and who does not fail to investigate and adopt the improvements being made by others in his line.

We are constantly making Dryer improvements for other successful brick men. Why not let us make some for you?

IT PAYS TO BE PROGRESSIVE.

L. E. RODGERS ENGINEERING COMPANY

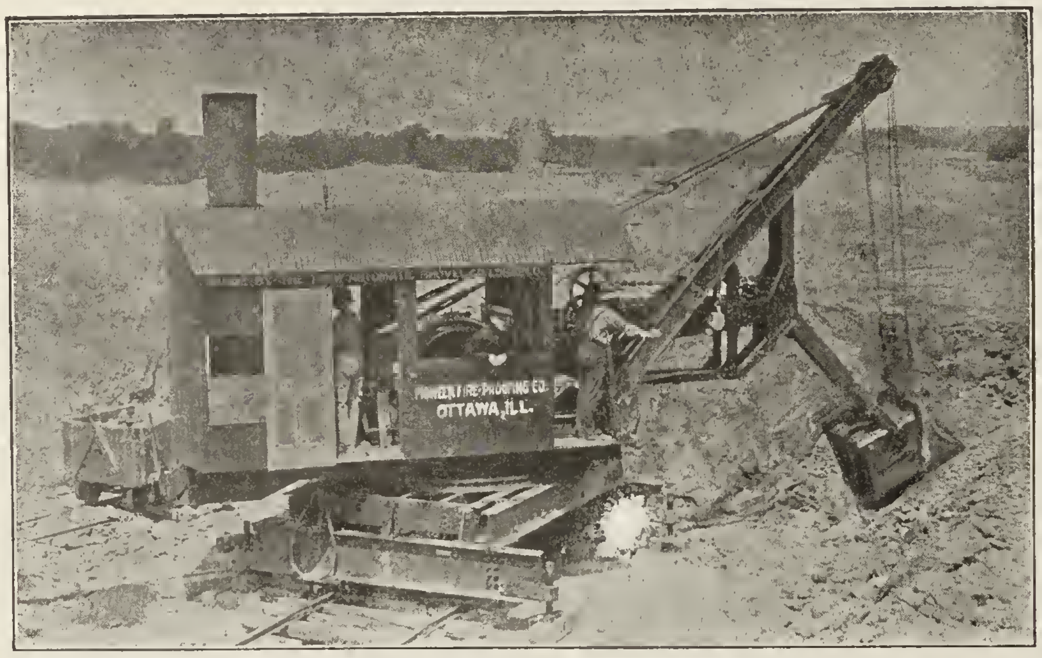
WASTE HEAT DRYER SPECIALISTS

303-305 Dearborn Street, CHICAGO

HANDLE YOUR CLAY WITH ONE MAN AND

The Thew Steam Shovels

Made in Four Sizes. Mounted on Car Wheels or Traction Wheels.



Type No. 2 Shovel—Pioneer Fireproofing Co., Ottawa, Ill.

Especially adapted for brickyard requirements. The shovel operates in a complete circle, enabling material to be delivered at side or in rear at will. The Dipper is hung from a horizontally moving carriage and can be adjusted to cut to any desired level.

: : Only One Operator Required.
Wire Cables used instead of Chains.
Strictly First-Class in Every Detail.

Economical for brickyards 30,000 to 40,000 aily capacity.

Operated by one man for outputs up to 125,000 brick per day.

Write us for Catalogues and Information.

THE THEW AUTOMATIC SHOVEL CO.,

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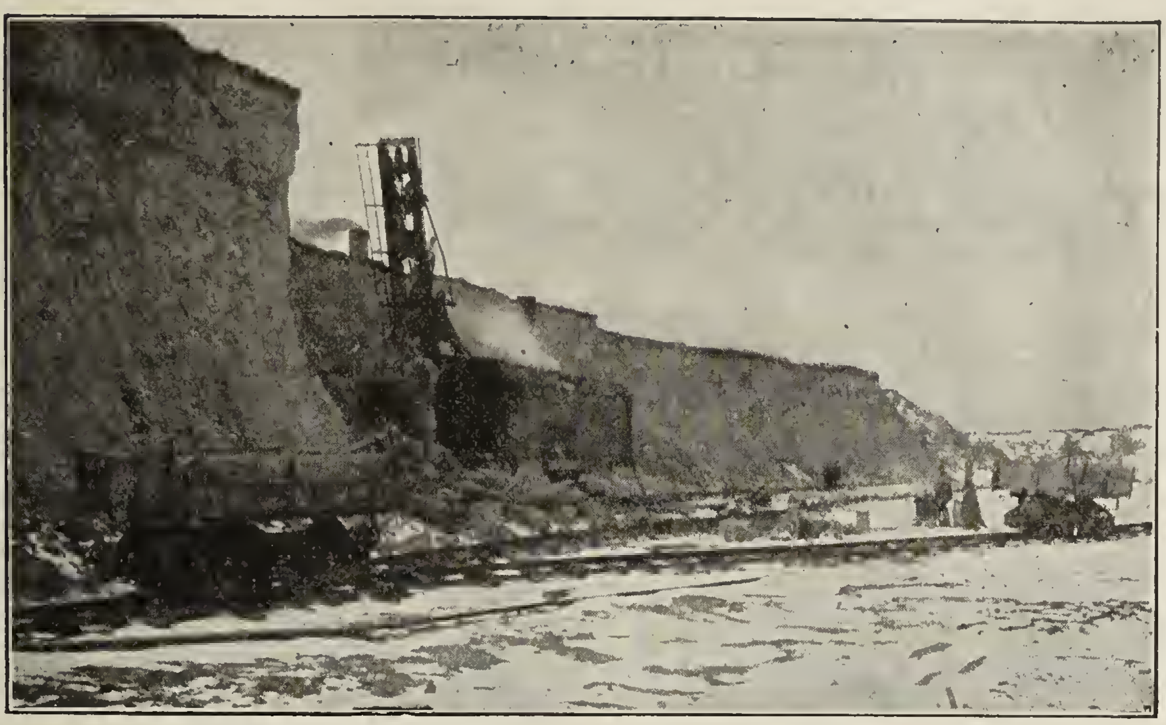
ELECTRIC CLAY HANDLING SYSTEM



Car Approaching the Shovel from Return Track.

We transport clay from the shovel to the plant, operated automatically and controlled entirely by the man at the hoist. A system that will save its cost in labor in 18 months, as it eliminates all labor between shovel and plant. Power to generate the electricity taken from any driving shaft. We invite personal inspection of plants in operation.

Patentees and Manufacturers of Automatic Machinery and Devices for Handling Clay, Coal and other material.

HAUSER COMPANY

GENERAL AND ELECTRICAL CONTRACTORS 271 MADISON ST., CHICAGO

Power Construction and the Design and Equipment of Modern Clay Working Plants.

National Brick Manufacturers' Association

ANNUAL MEETING

Birmingham, Ala., January 30th-February 11th, 1905. Special Low Rates. Best Service. Via Cincinnati, Chattanooga and the

"QUEEN & CRESCENT ROUTE"

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National Association
Brick Manufacturers' Convention

BIRMINGHAM, ALABAMA

January 31st to February 4th, 1905

$26.35

FOR THE ROUND TRIP

Your trains leave at 1:15 P. M. and 7:00 P. M. from the **La Salle Street Station on the Elevated Loop, Chicago,** one to six blocks from all the leading hotels in the heart of the city and arrive in Birmingham at 8:25 A. M. and 3:30 P. M. respectively. Through Sleepers and Dining Cars.

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CHICAGO & EASTERN ILLINOIS R. R.

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CONVENTION

Conveniently reached from Chicago
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MONON ROUTE

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By way of Cincinnati and through the
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Meet the Eastern Contingent at Cincinnati

Leave Chicago	9:02 P. M.
Arrive Cincinnati	7:40 A. M.
Leave Cincinnati	8:30 A. M.
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Arrive Birmingham	10:20 P. M.

Sleeper from Chicago.

Dining Car and Observation Car from Cincinnati.

Have a good night rest at Birmingham and be fresh for the Convention in the morning. For rates and full information address

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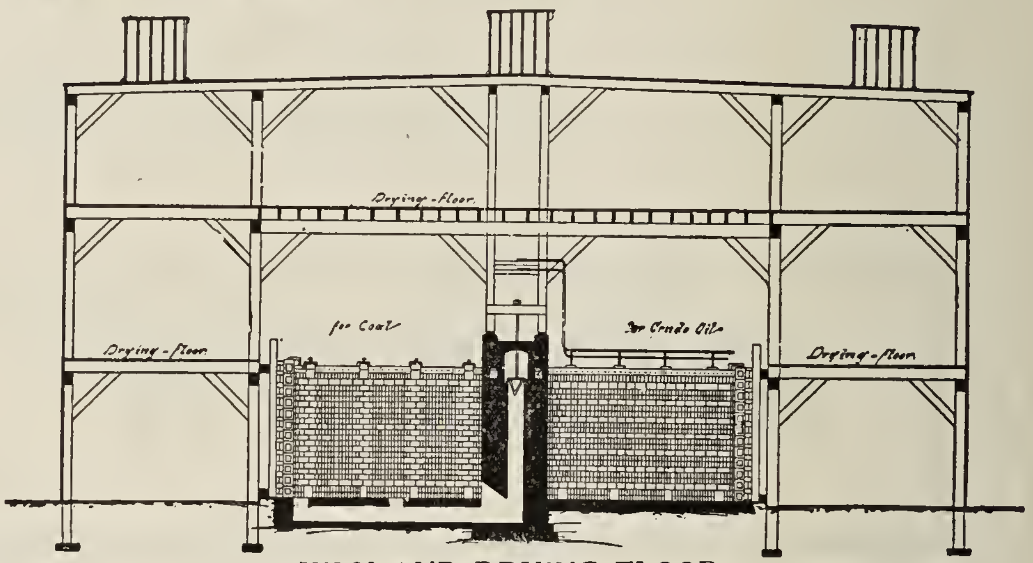
T. P. A. MONON ROUTE
232 Clark Street, CHICAGO

Lehmann Portable Continuous Kiln in Combination with Drying Floors...

CHEAPEST AND SIMPLEST CONTINUOUS KILN ON THE MARKET

Can be constructed ready for work in six to eight weeks, and adapted to all kinds of fuel. Saves 65 to 75 per cent. on fuel as compared with up-draft or down-draft kilns. Drying is done by heat escaping from kiln without extra expense, gradually, uniformly and thoroughly. Goods are handled by automatic delivery elevators, and cost of handling, drying and burning is reduced to a minimum.



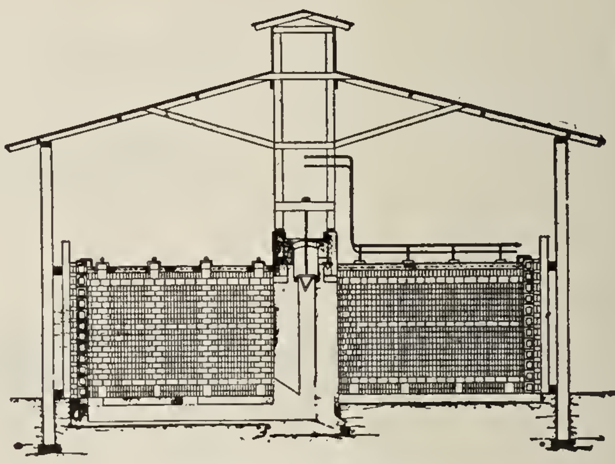
KILN AND DRYING FLOOR.

Lehmann Crude Oil Burning Apparatus

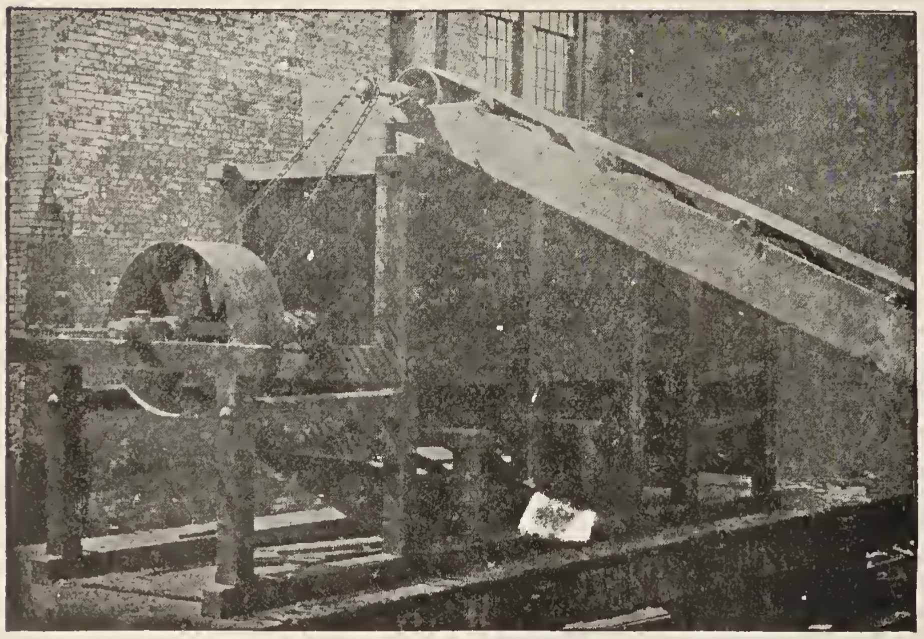
First successful attempt to burn Crude Oil in a Continuous Kiln; can be applied to any system.

Lehmann Metal Lined, Self-Lubricating Die

Can be made and adapted to any kind of clay at the place of manufacture, and insures uniformity of size of manufactured goods.



CONTINUOUS KILN



LEHMANN SLUMMING MACHINE

Lehmann Slumming Machine

MOST PRACTICAL, SIMPLE AND EFFECTIVE

The slumming process is the most economical and the only reliable method for removing gravel and other foreign matter from Common Clay, Kaolin, Chalk, Mineral Paints, etc.

ALL THESE DEVICES HAVE BEEN TRIED THOROUGHLY AND SUCCESSFULLY.

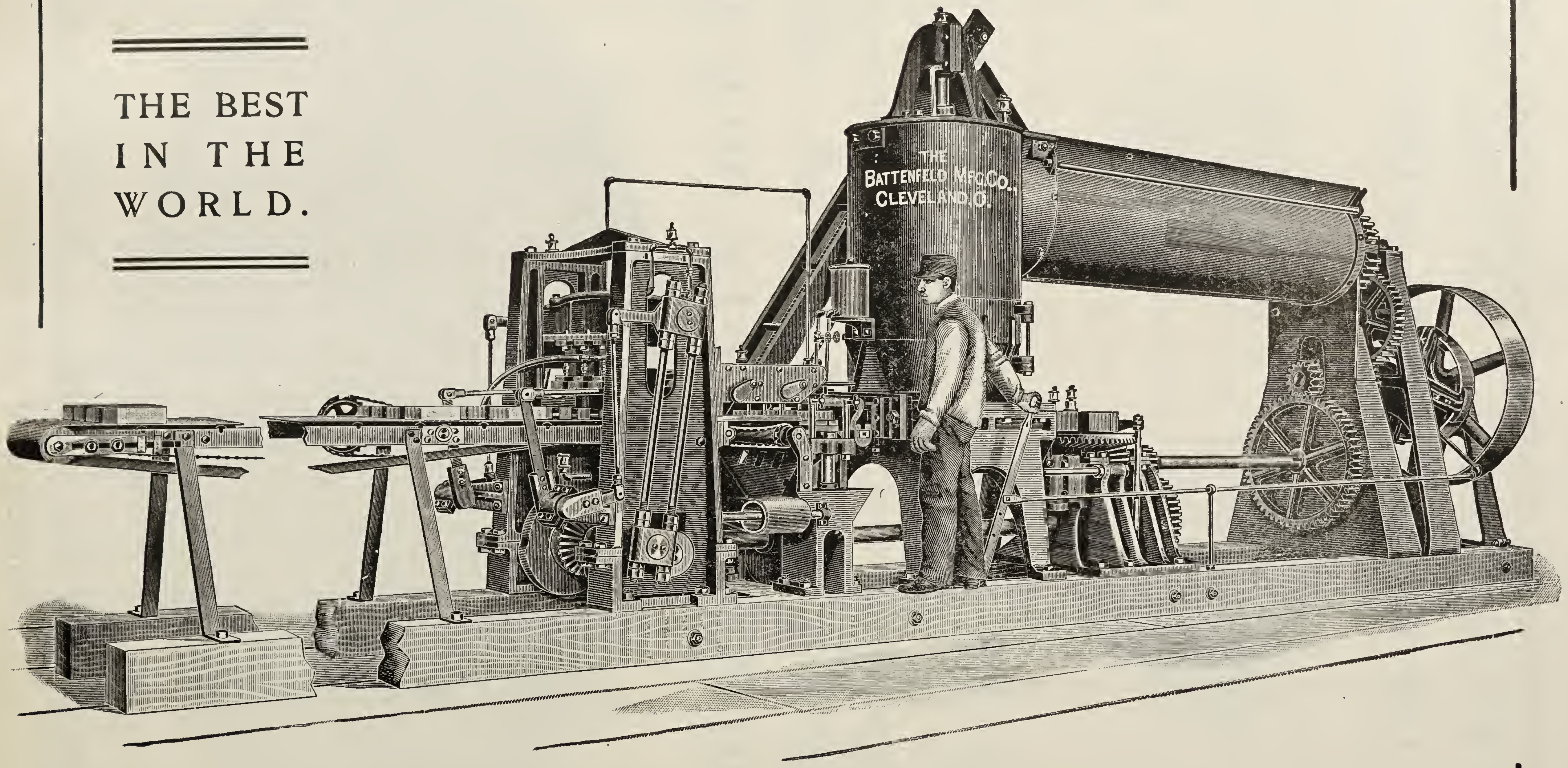
Will plan and construct any system of Kiln... Up-Draft, Down-Draft, Muffle or Tunnel. Plans and estimates furnished for Brick and Tile, Lime and Cement Work. Practical tests made.

F. LEHMANN COMPANY

Consulting Clay-Worker Engineers,
163 Rhine Street, Chicago, Ill.

THE DICTATOR BRICK MACHINE

THE BEST
IN THE
WORLD.



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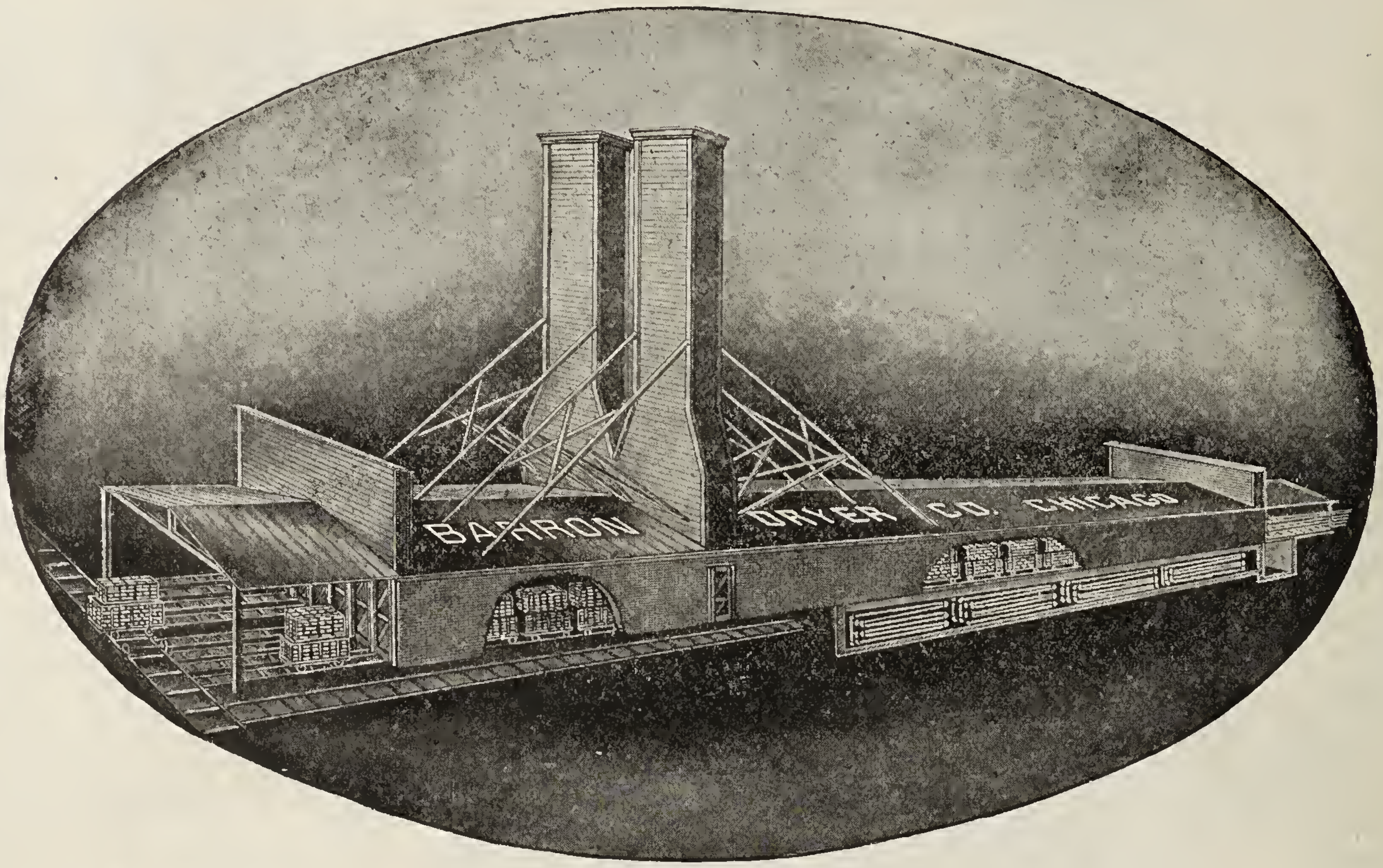
WRITE FOR CATALOGUE.

CLEVELAND, OHIO.



If You Are Progressive

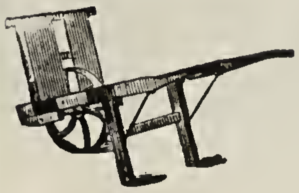
You know that the brickmakers who are making the money in these days are those who have installed an up-to-date drying system enabling them to cope with ease with the heaviest demands of the market, their operations being uninterrupted all the year round.

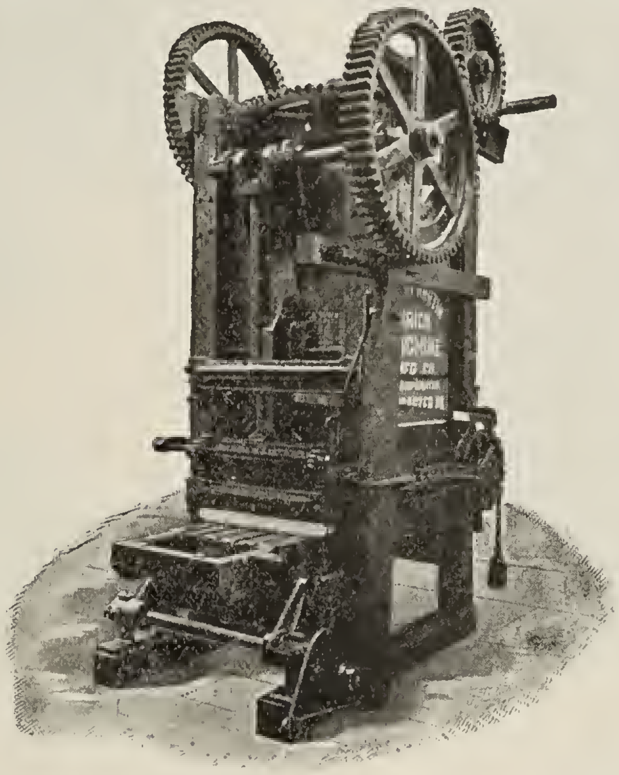
This is true of them, what of your case? Why adhere still to antiquated methods subjected to weather limitations. Determine to install the most effective drying system in existence and apply for information and quotations to the

BARRON DRYER COMPANY

Temple Court Building, 225 Dearborn Street, CHICAGO, ILL.

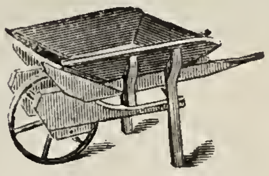
THE BEST IS THE CHEAPEST IN THE END

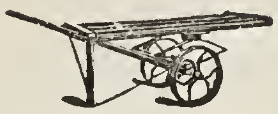




The Machine
that
"makes good"
Brick

"Best by Test"
Martin
Machinery





Martin's Style "A."

Have you a copy of our 1905 catalogue? Better consult it before you buy elsewhere.

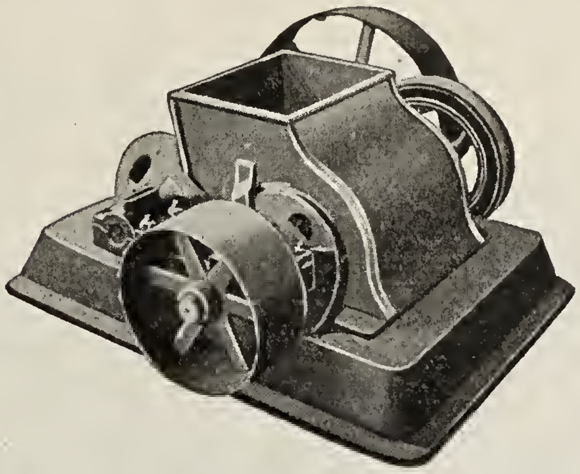
Our Engineering Department is ever at your service. Consult our experts on brick yard troubles.

SOFT MUD PLANTS

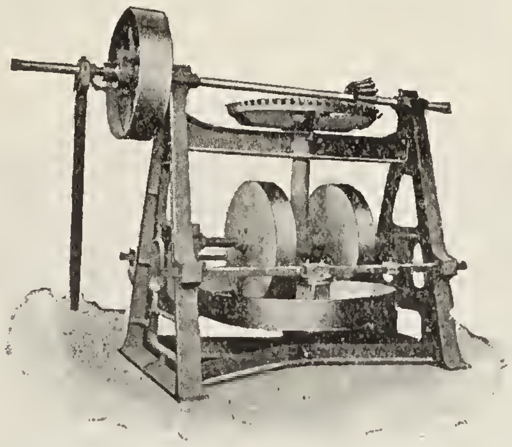
AUGER MACHINERY

MARTIN

IN STEAM DRYING there is no system as simple as the MARTIN, or that will give more satisfactory results, and at as low a cost for continual operation. Will **positively** dry the brick over night. No cars, fans, blowers, trucks or engines. Let us talk the matter over with you.



DISINTEGRATORS.



DRY AND WET PANS.

ROCK CRUSHING PLANTS

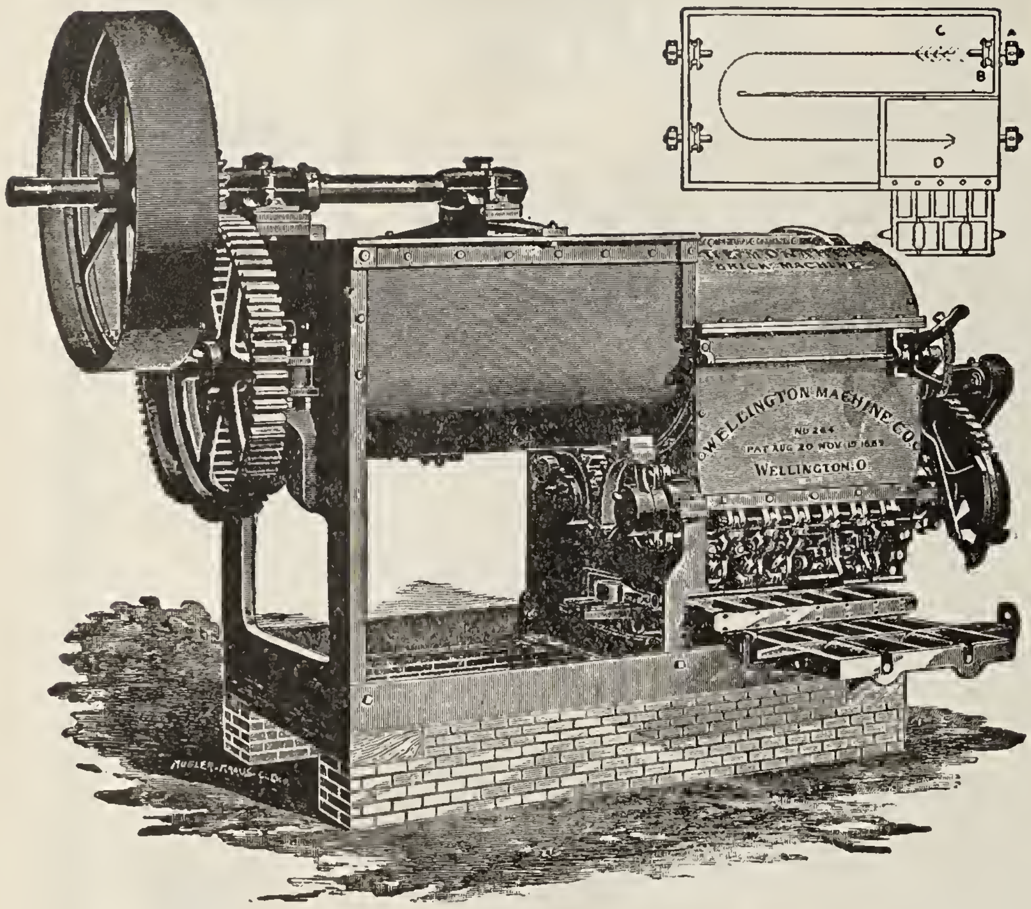
ELEVATORS AND CONVEYORS

WE FURNISH EVERYTHING A BRICKMAKER NEEDS.

THE HENRY MARTIN BRICK MACHINE MFG. CO.

LANCASTER, PA., U. S. A.

BRICK and TILE MACHINERY


WELLINGTON MACHINE CO.
No 264
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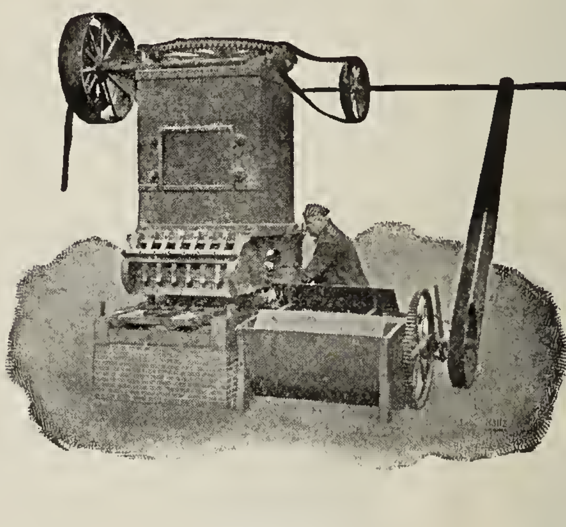
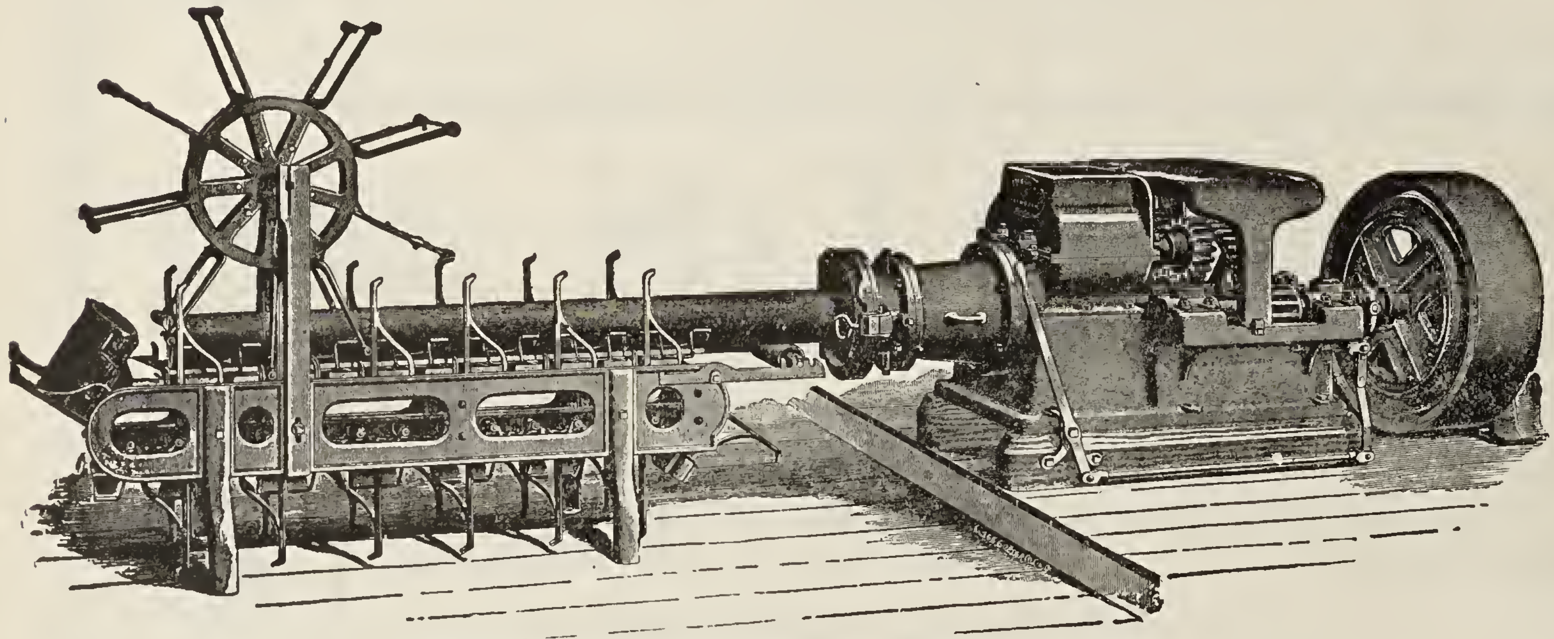
WELLINGTON, O.

MONARCH STOCK BRICK MACHINE
Capacity, from 30,000 to 50,000



THE QUAKER
Horse or Steam Power. Capacity, 20,00 to 35,000

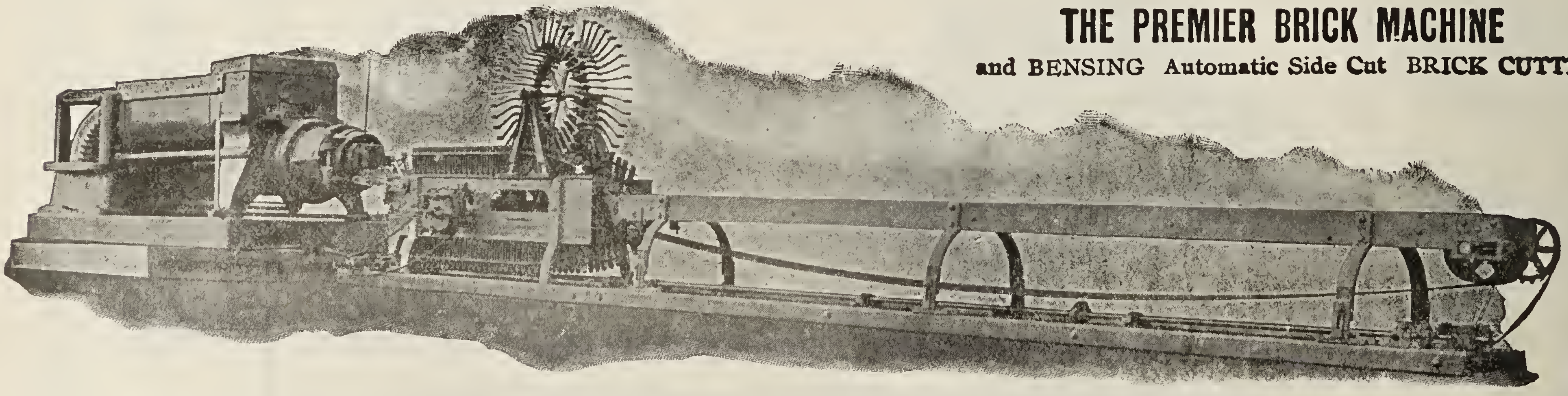


BRICK OR TILE MACHINE. WITH AUTOMATIC TABLE

"We Fulfill our Guarantees."

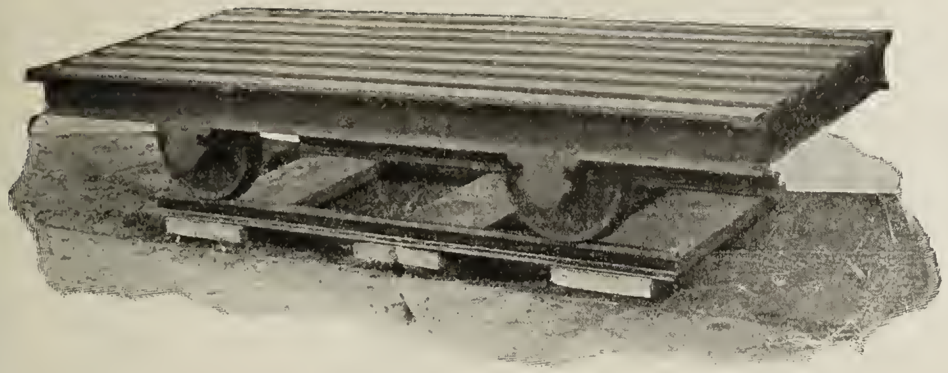
THE PREMIER BRICK MACHINE

and BENSING Automatic Side Cut BRICK CUTTER.



We have a full line of Clay-Working Machinery, sand mold brick machines, auger brick and tile machines, Automatic side and end cut tables, dies, molds, barrows, trucks, sanders, represses, pug mills. *The only down cut, reel side brick cutter on the market for cutting face brick that do not require repressing.* We can guarantee to make you a better face brick with this cutter than you can get from any other cutter on the market.

B. E. LaDOW, 701 Dwight Building, KANSAS CITY, MO.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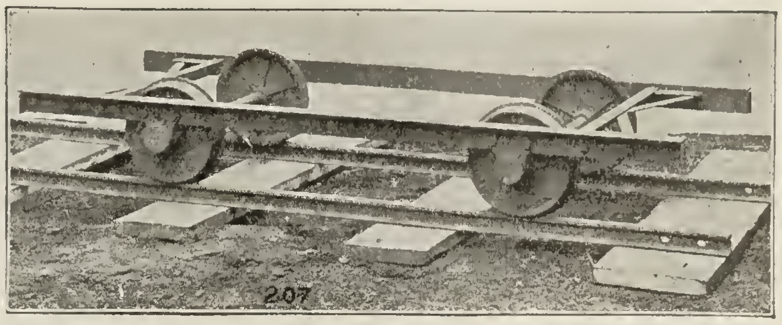
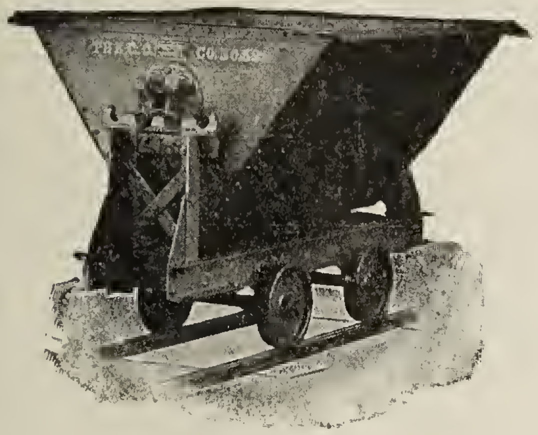
STEEL DECK CAR, CHANNEL FRAME.
For Drying Brick, Sewer Pipe, Etc.



No. 207.
FLAT CAR, WOODEN DECK.
For Brick, Tile, Etc.

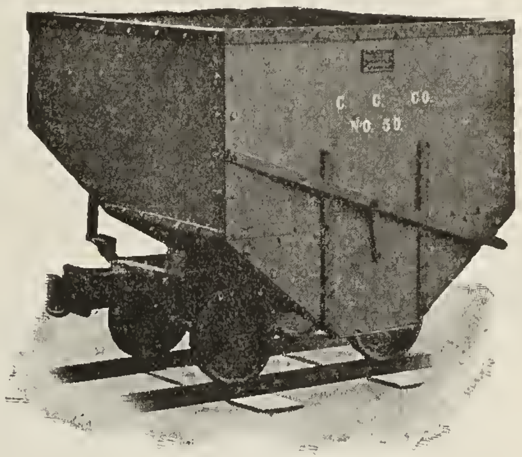

No. 52.
TRUNION DUMP CAR.
For Handling Coal, Sand, Ashes, Etc.

The Cleveland Car Company

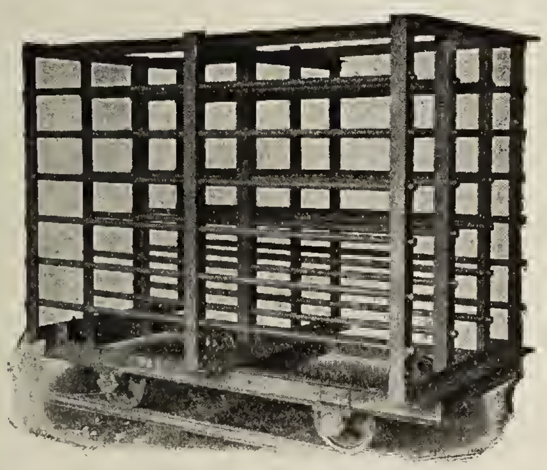
West Park -:- Ohio

Designers and Builders of

Complete Equipment for Narrow Guage Railroads

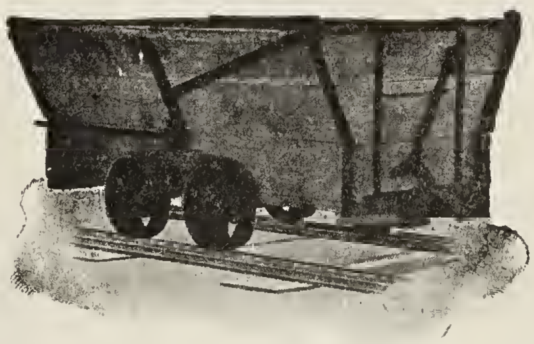


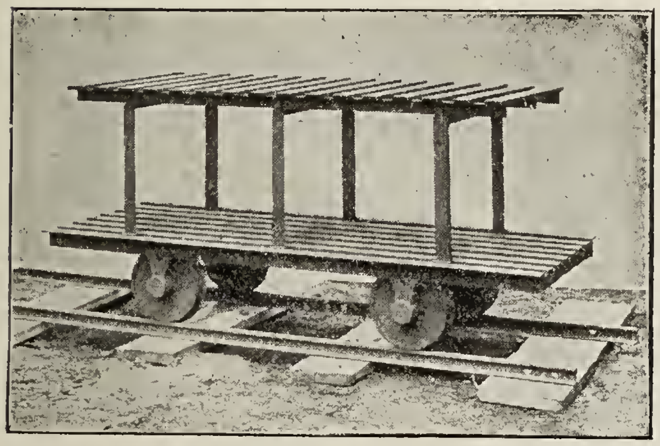
No. 50.
ONE SIDE DUMP CAR.
For Dumping Into Dry Pans, Disintegrators and Crushers.

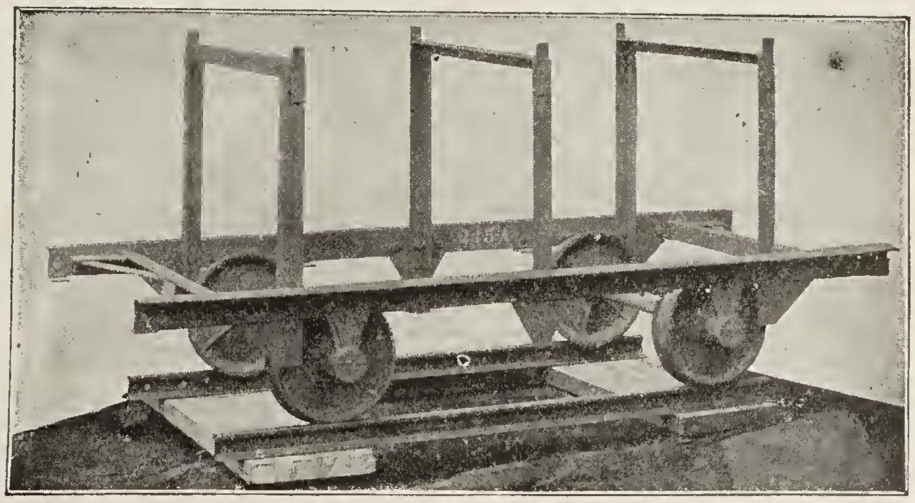

No. 523.
RACK CAR, HEAVY TYPE.
For Use With Coke Oven, Furnace and Cupola Block.

Dryer Cars of Every Description, Dump Cars, Turn Tables, Transfer Cars, Switches, Frogs, Rails, Etc.

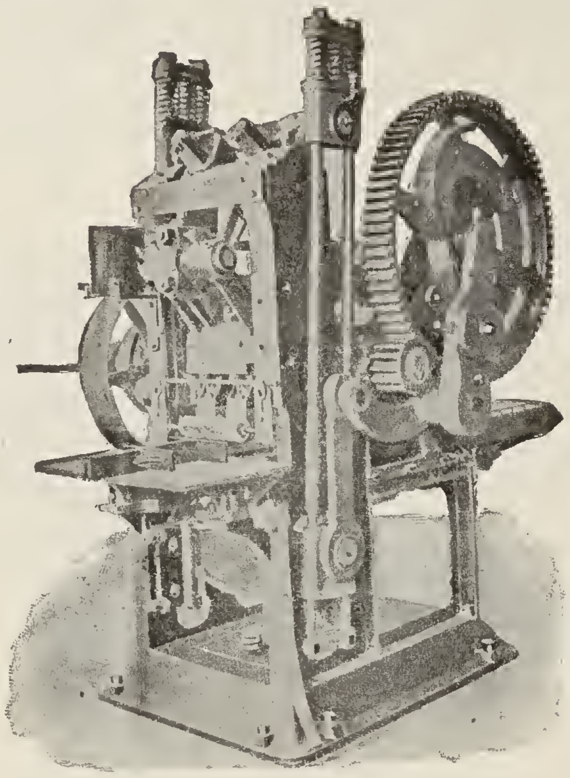
Overhead Trolleys, Kiln Doors, Furnace Fronts, Grate Bars and Brick Barrows : : : :


No. 31.
END DUMP CAR.
Adapted to Handling Coal, Shale, Sand, Etc.


No. 244.
DOUBLE DECK CAR, STEEL DECKS.
For Brick, Tile, Fire-Proofing, Etc.


No. 245A.
DOUBLE DECK CAR, WOODEN DECK.
For Brick and Other Clay Products.

THE RICHARDSON REPRESS



Richardson Double Die Repress.

HAS NEVER BEEN REPLACED by one of another make.

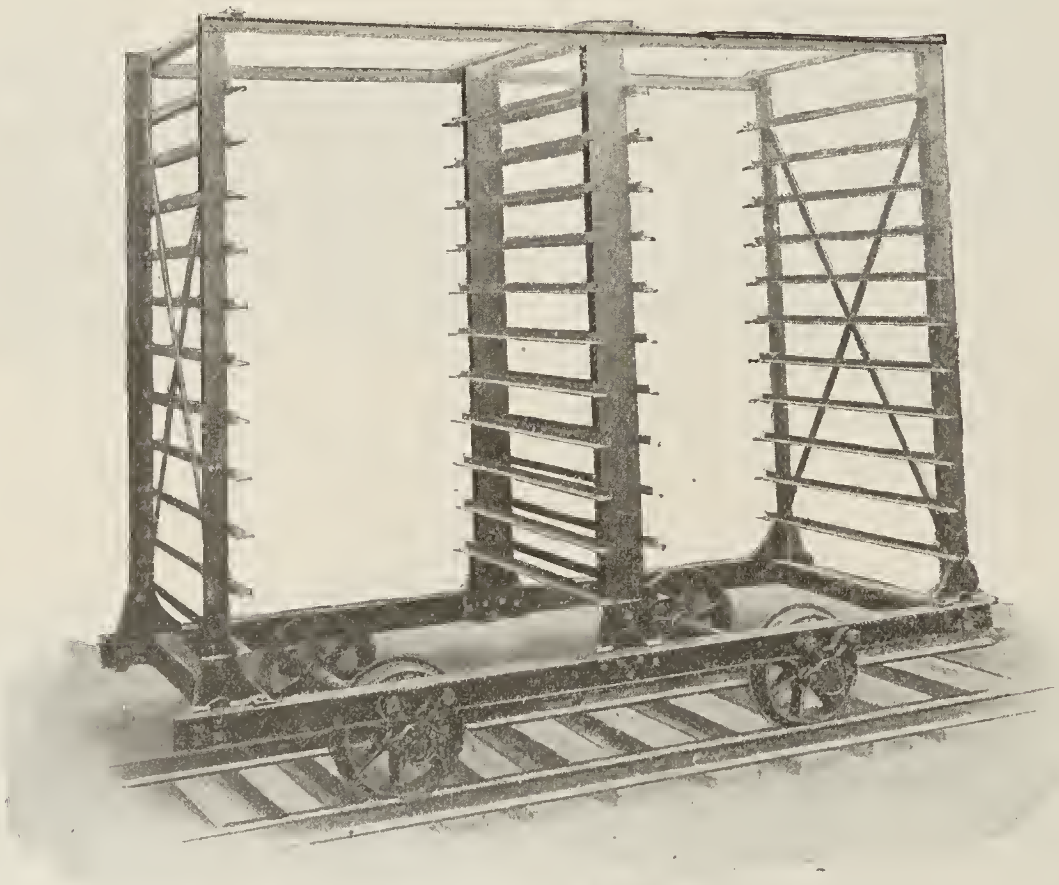
This is a fact that we think it not improper to boast of.

Do you not agree with us and is this not the repress you want in your plant?

"We also have another boast coming." We never had any of our dryer cars rejected.

They are fit companions for our repress.

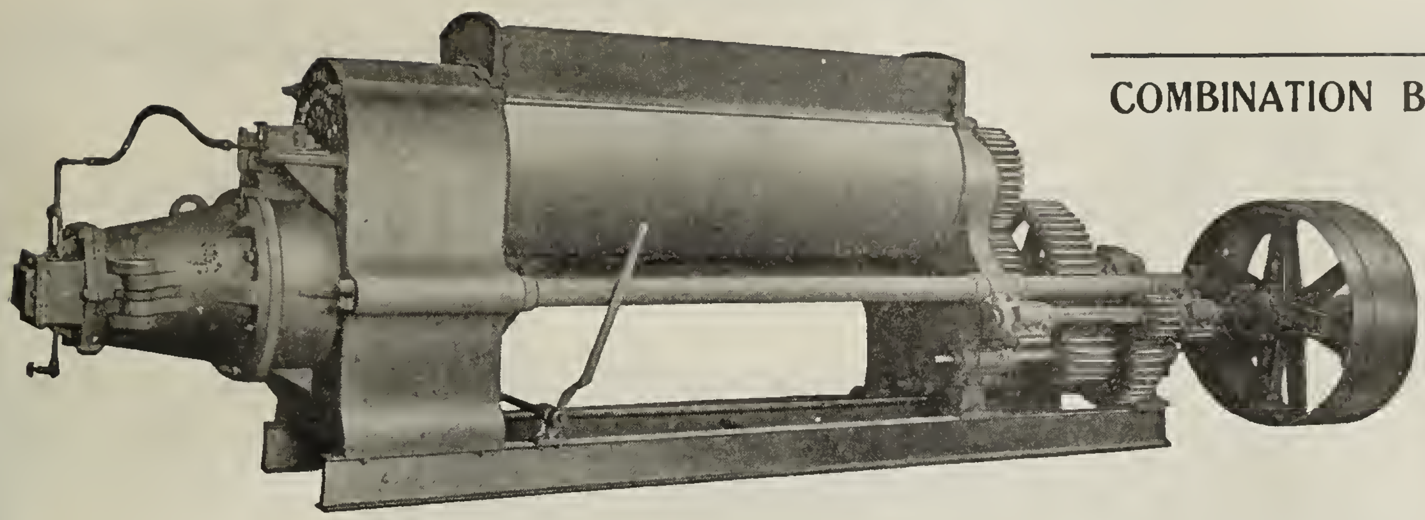
We are prepared to furnish you any machinery you want or will build your plant complete.



Soft Mud Rack Car.

The Ohio Ceramic Engineering Company

Cleveland, Ohio.



COMBINATION BRICK MACHINE

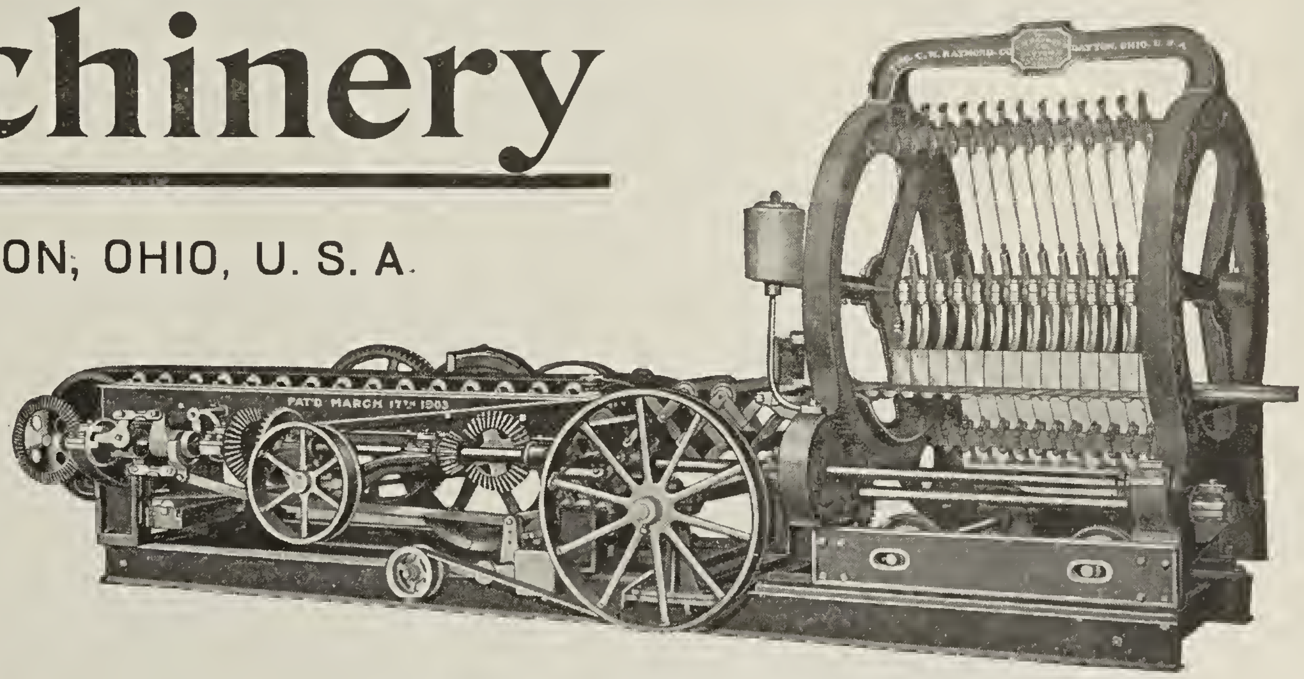
THE

C. W. RAYMOND CO

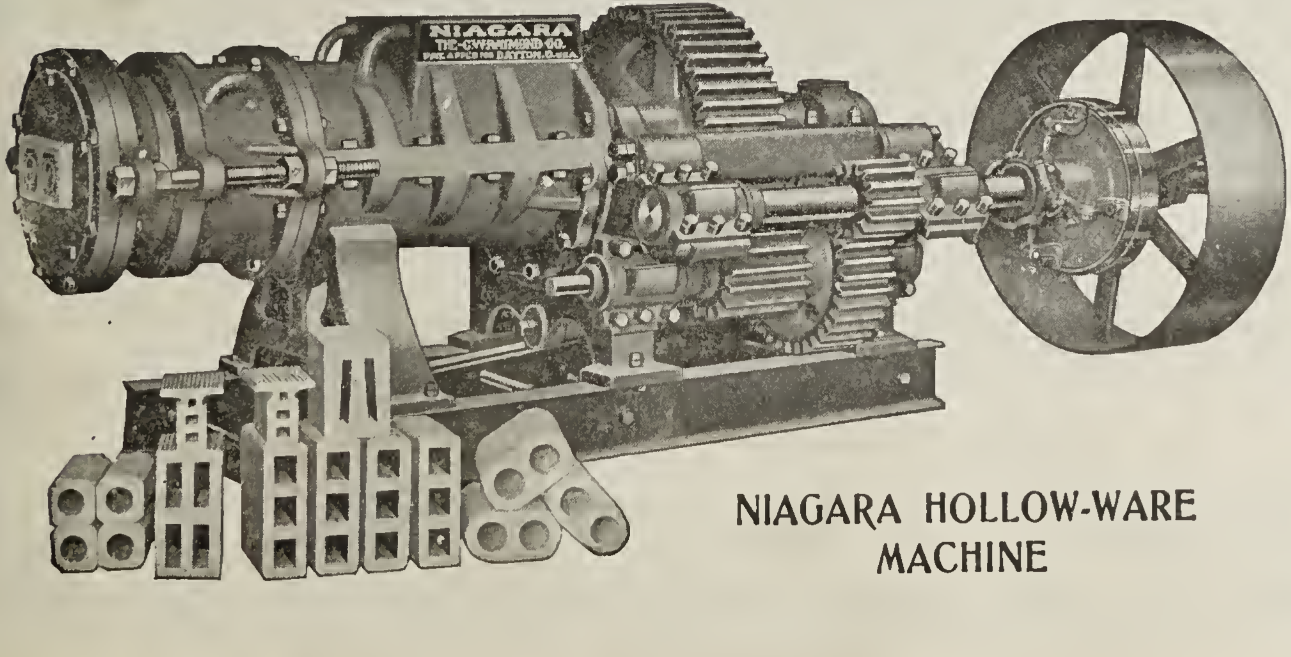
Clay-Working Machinery

DAYTON, OHIO, U. S. A.

NEW YORK
39—41 Cortlandt Street
ST. LOUIS
315 Frisco Building
PITTSBURG
1425 Park Building



AUTOMATIC DOWN-CUT CUTTER

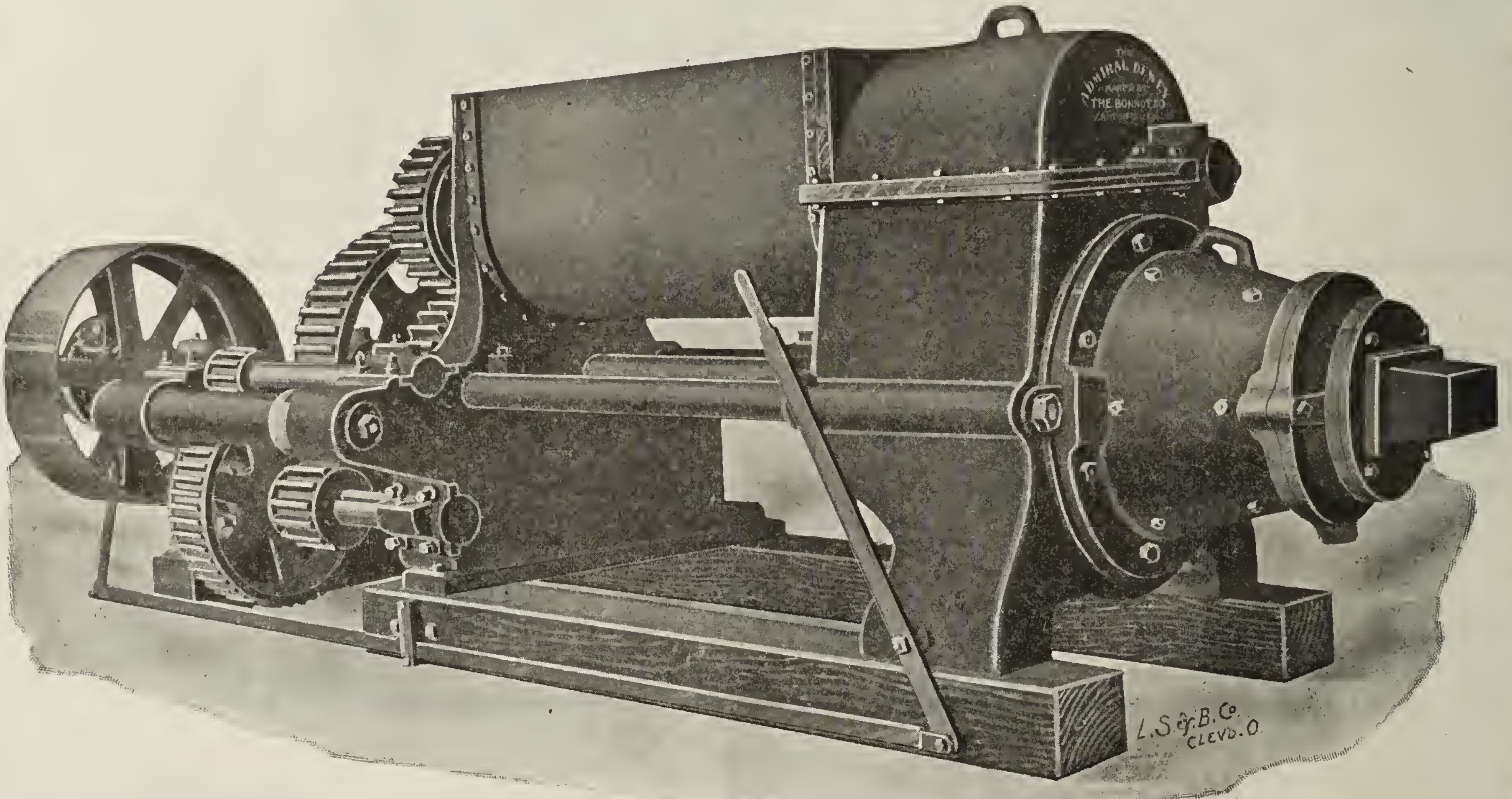


NIAGARA HOLLOW-WARE MACHINE

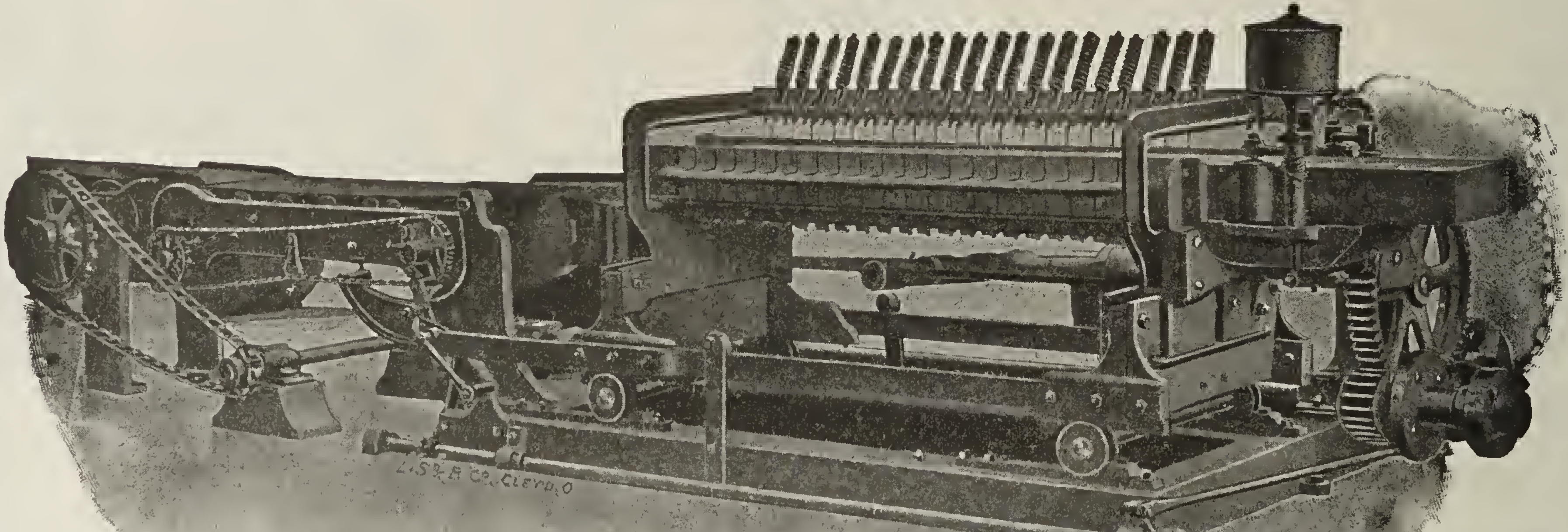
Raymond Machinery
Creates New
Business for the User
Better Brick
and more of them.

CATALOGUE

Modern Brick Machinery


THE ADMIRAL DEWEY MADE BY THE BONNOT CO. CANTON, O.
L.S.&B.Co. CLEV'D.O.

SPECIAL COMBINED BRICK MACHINE AND PUG MILL 100,000 daily capacity.
AUGER BRICK MACHINES 10,000 to 100,000 capacity, five sizes.


L.S.&B.Co. CLEV'D.O.

AUTOMATIC SIDE CUT TABLE. Simple, positive, durable.

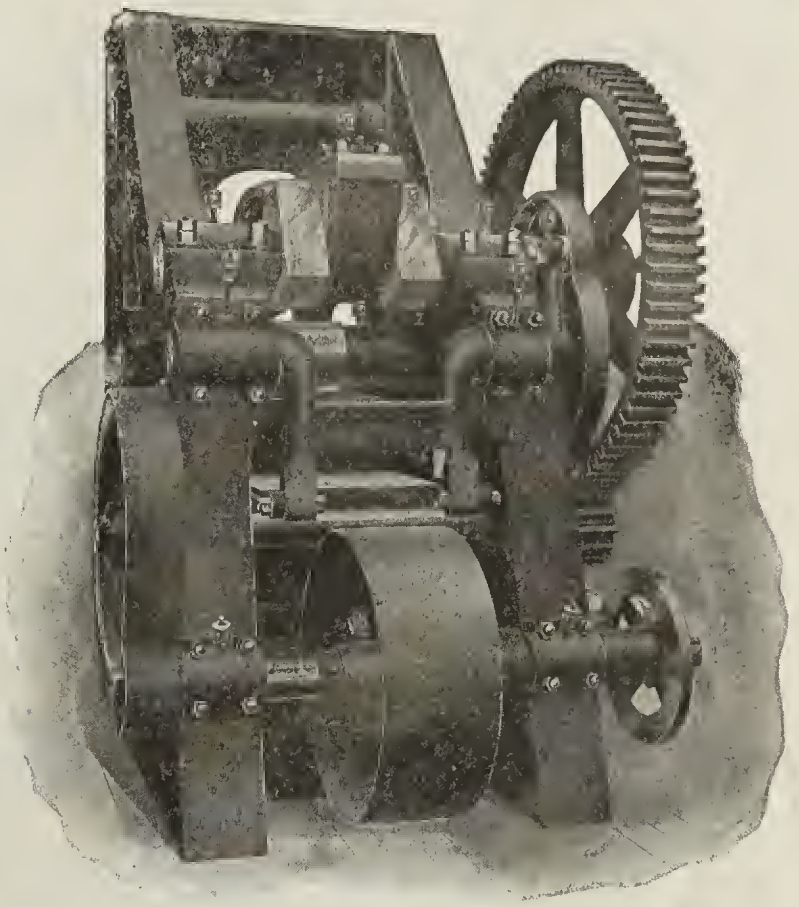
COMPLETE EQUIPMENTS FOR BRICKMAKERS. *ASK FOR CATALOGUE.*

THE BONNOT COMPANY, Canton, Ohio.

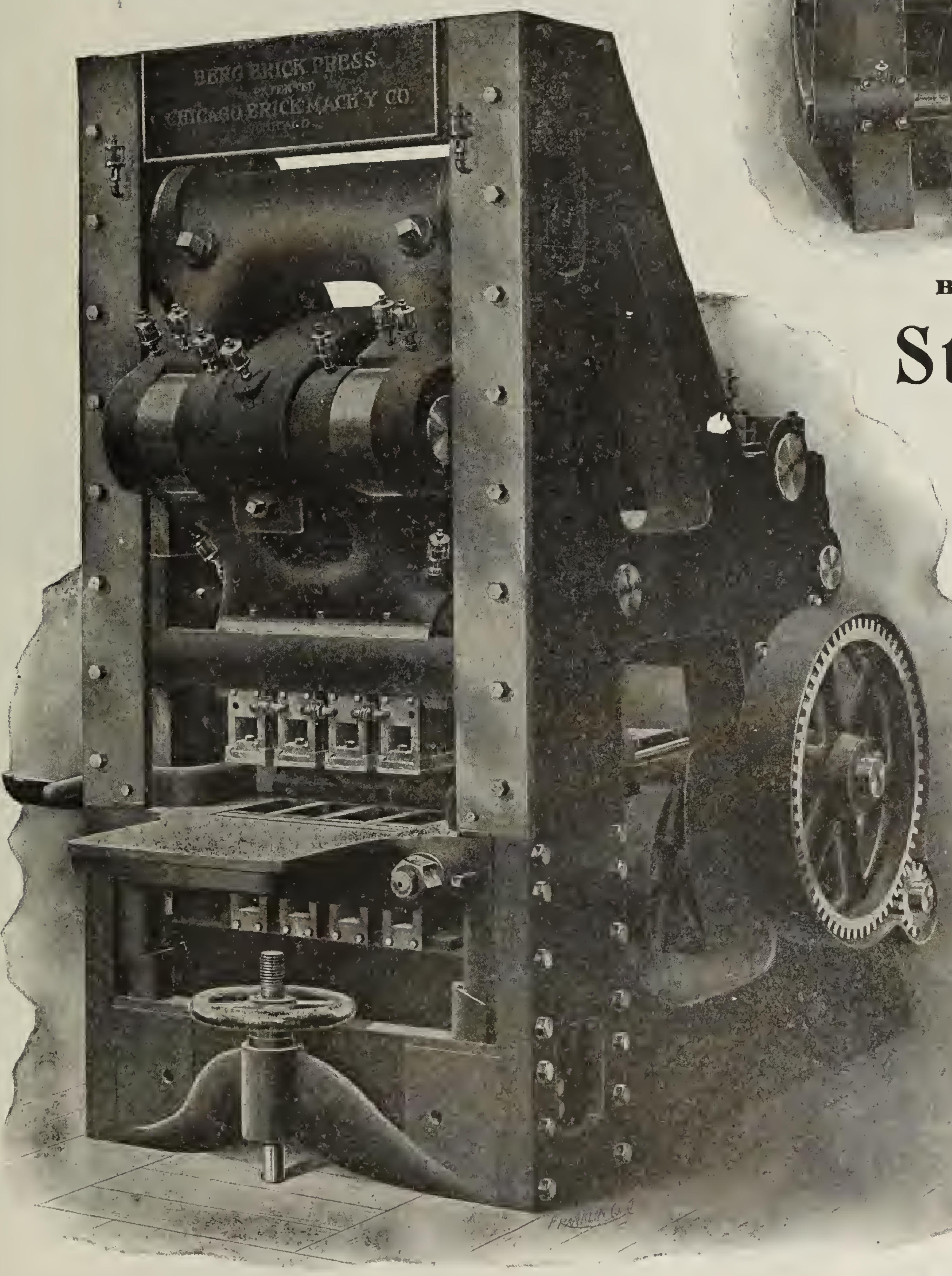
—WESTERN AGENTS—

CHICAGO BRICK MACHINERY CO., - - 77 Jackson Boulevard, Chicago, Ill.

NEW MODEL
BERG BRICK PRESS



Back View.



Still in the Lead

AND

One Step Further Forward

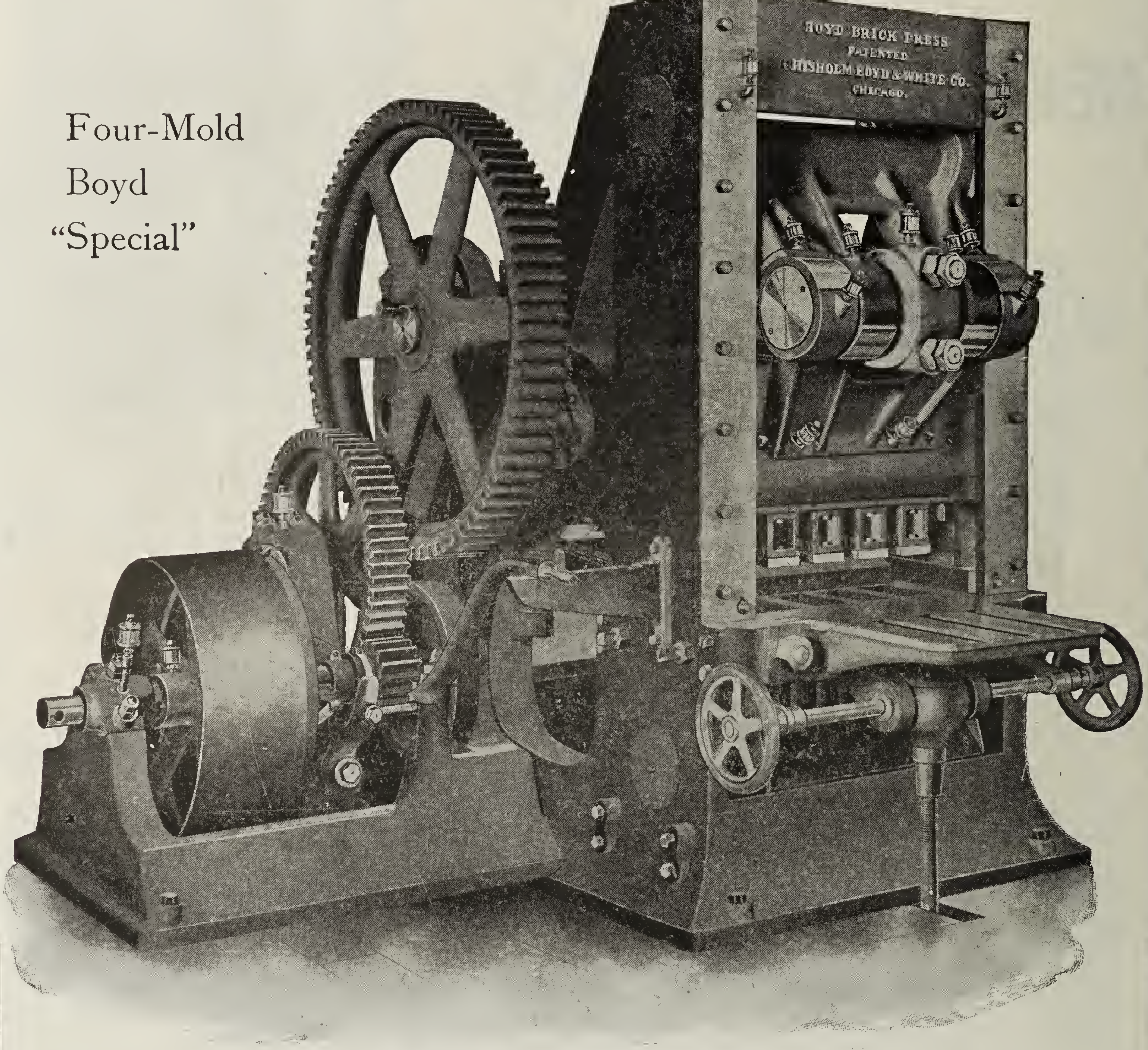
Even stronger than ever and all self-contained. Greater pressure and fewer working parts than any other machine. Simple, massive, compact. Running mechanism placed in rear, as shown in upper cut, enabling this machine to be SHIPPED IN ONE PIECE.

MANUFACTURED BY
ANDERSON FOUNDRY & MACHINE WORKS
Anderson, Indiana.

SOLD BY
CHICAGO BRICK MACHINERY COMPANY
77 Jackson Boulevard, Chicago.

The Boyd Brick Press

Four-Mold
Boyd
"Special"



A Business Proposition.

We will send to any responsible party a **BOYD BRICK PRESS ON TRIAL** and subject to purchase after the making and burning of one or more kilns of brick. We take the machine back if not satisfactory.

THE BOYD BRICK PRESS exerts greater pressure, holds it longer, puts more clay into brick, and makes stronger brick than any other Brick Press made. Especially adapted for working shales, and is the only successful machine for making fire brick.

ALL BOYD PRESSES are fitted with our IMPROVED PATENTED MOLD BOX, the liners of which are made of the hardest and toughest known metal, which can be reground at low cost when worn. The molds can be changed in a few minutes.

ITS RECORD: More Boyd Presses in actual operation than of all other Press Brick Machines combined. Write for General Catalogue No. 10.

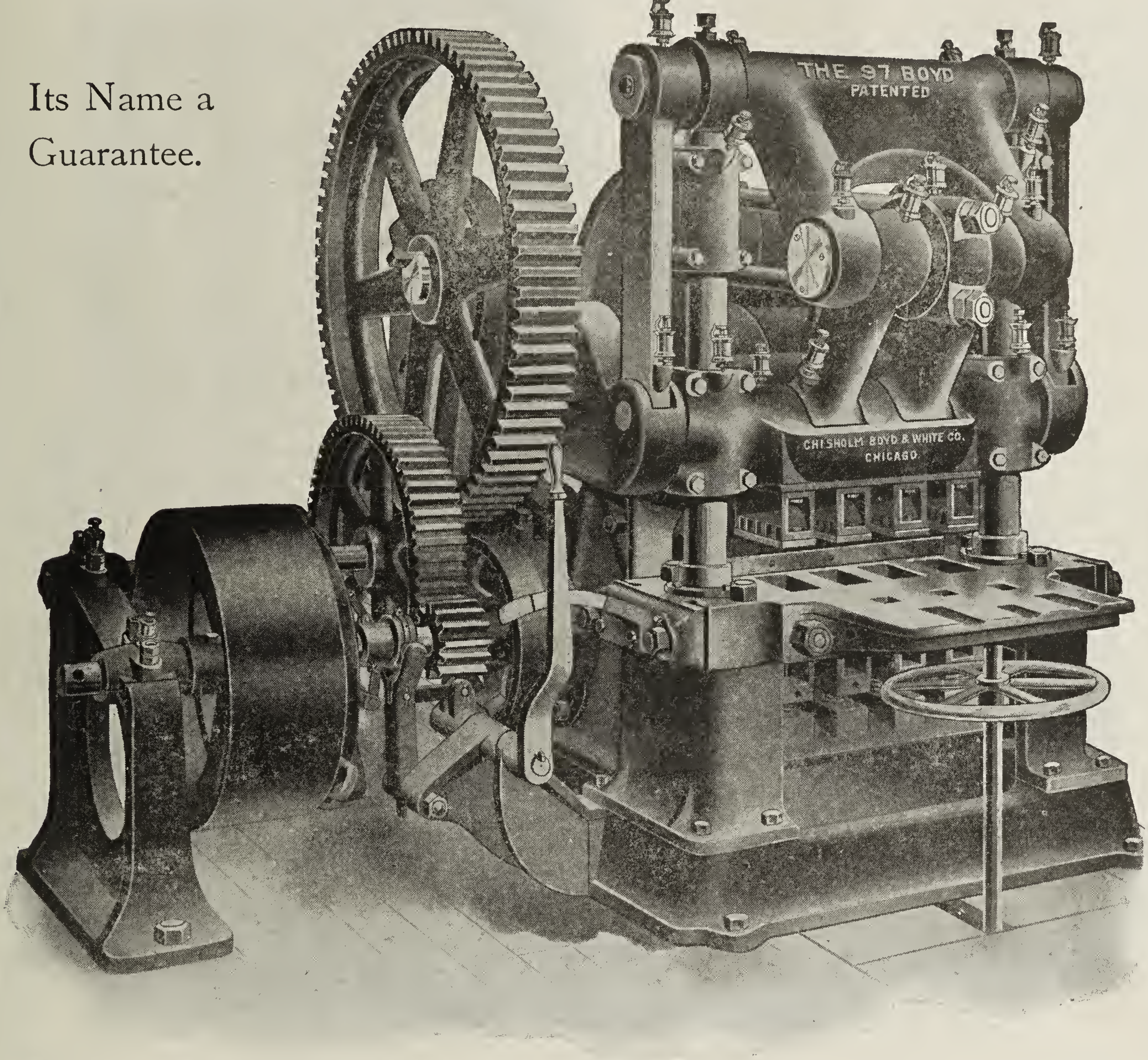
Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

The Boyd Brick Press

The '97 Model

Its Name a
Guarantee.



THE '97 MODEL BOYD BRICK PRESS has enormous strength and great durability; it is compact; the adjustments are convenient; it operates quietly and smoothly; the workmanship and material are of the best; the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking.

THE BOYD is the only Brick Press provided with an independent adjusting device for regulating the amount of clay in the molds and the pressure on the brick. This feature positively ensures equal pressure and finish on both sides of the brick, and no granulated or soft centers.

Sent on trial and fully guaranteed. Seventy presses of this pattern now in use. Cannot be broken in pressing brick. Write for descriptive catalogue No. 9.

Chisholm, Boyd & White Company

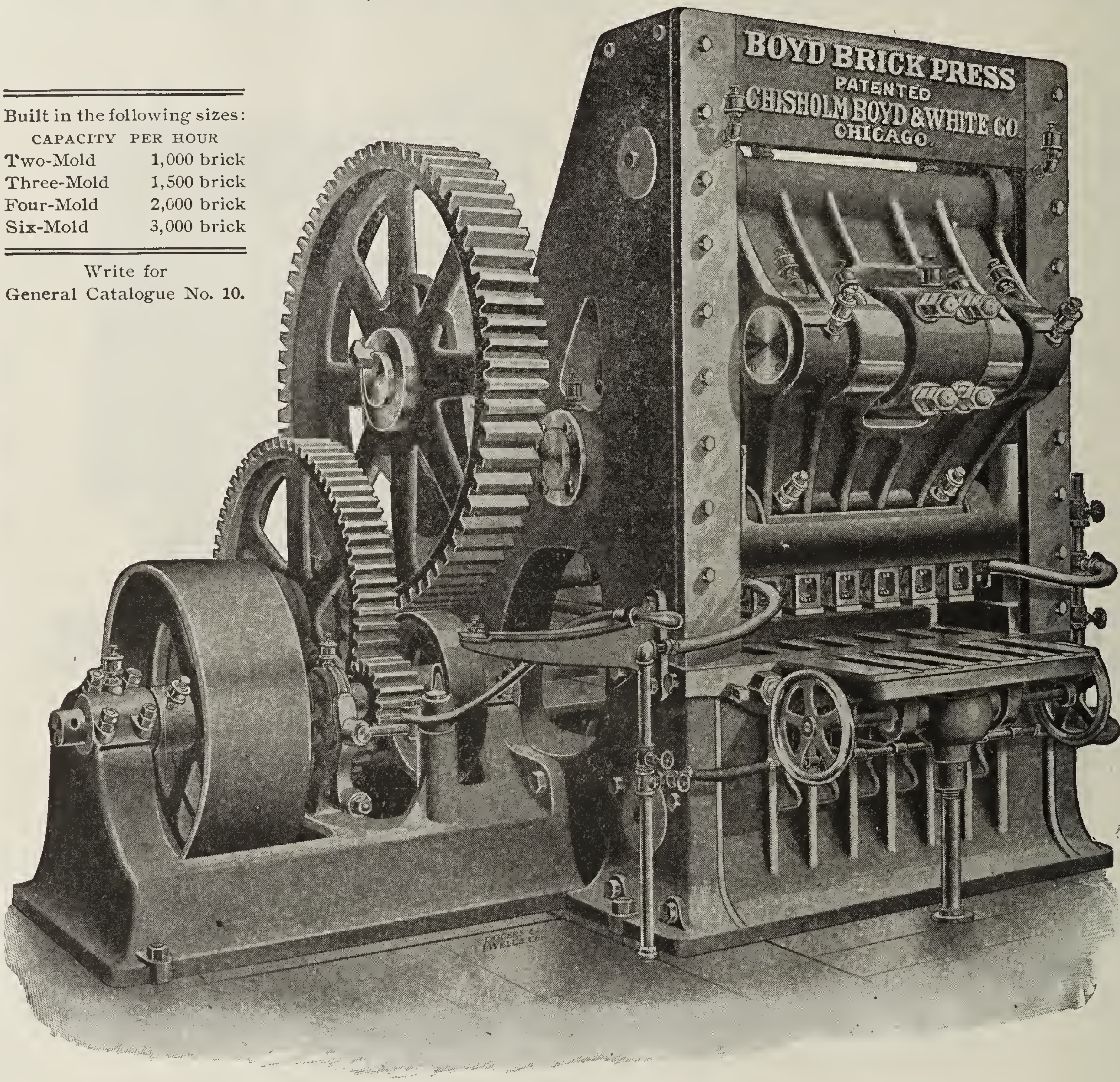
Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

The Boyd Brick Press

Built in the following sizes:

	CAPACITY PER HOUR
Two-Mold	1,000 brick
Three-Mold	1,500 brick
Four-Mold	2,000 brick
Six-Mold	3,000 brick

Write for
General Catalogue No. 10.



Another Record for the Boyd Press:

Six of our SIX-MOLD PRESSES in use on ONE YARD since 1892. Average cost of repairs for each machine One Dollar per year.

THE BOYD PRESS has always been distinguished for originality in design and construction. It will make better brick from clay or shale than can be made from the same material by any other press. It is selected and purchased by the most progressive Brick Makers. The largest and most successful brick plants in the country are using Boyd Presses.

Chisholm, Boyd & White Company

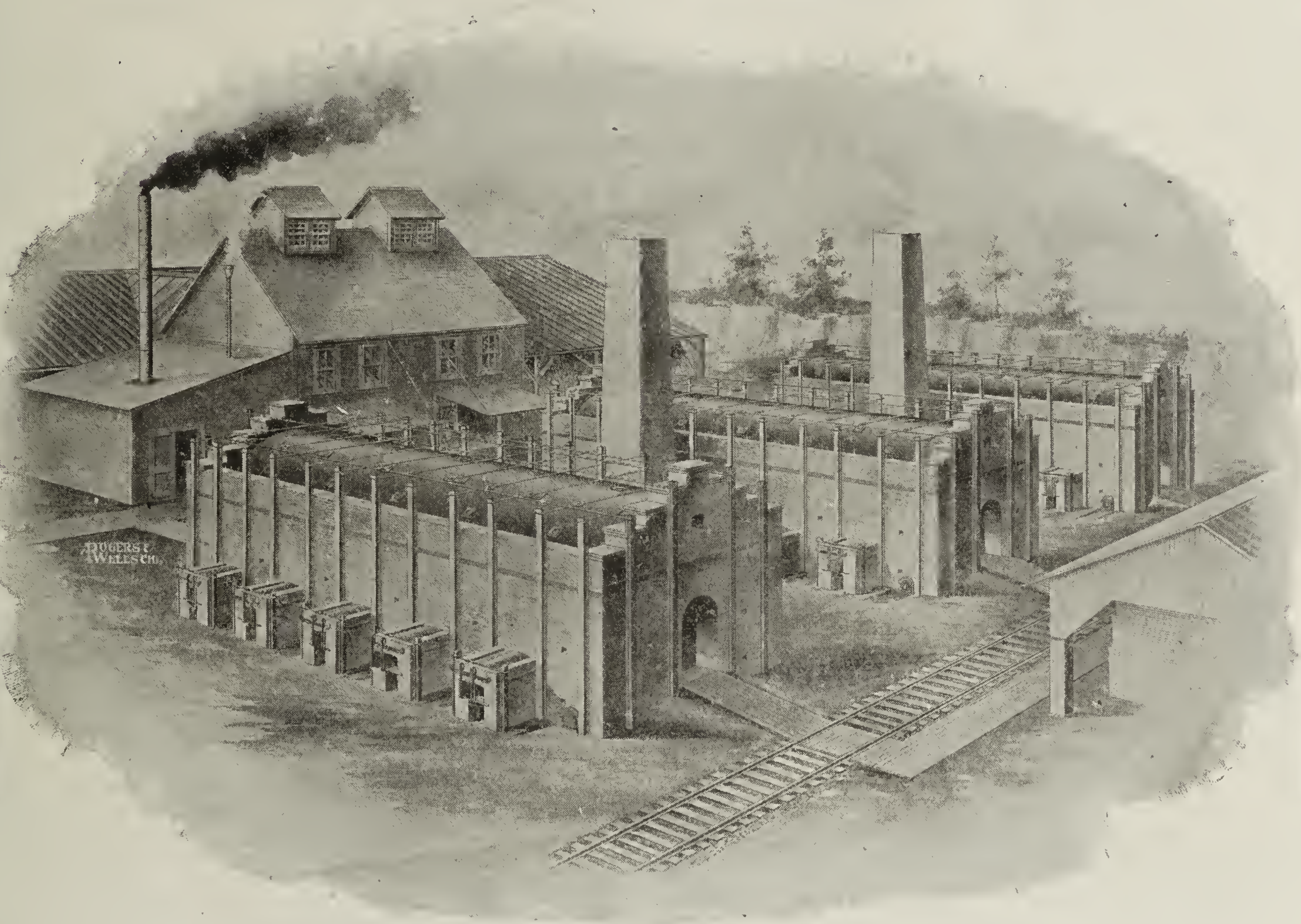
Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

Chisholm, Boyd & White Company

Engineers and Contractors for Brick Plants.

MANUFACTURERS OF

The Boyd Brick Press


ROGERS & WELLS CHI.

A MODERN BRICK PLANT—As Equipped by us.

A Sure Thing—We design, construct and equip Brick Plants of any desired capacity, furnishing the brickmaking machinery and power plant, erect the necessary buildings and kilns, and turn the plant over to the purchaser in proper working order, under guarantee of satisfactory results.

Brick Plants designed and equipped by us have the highest reputation for efficiency. They are modern, up-to-date, compact, convenient in arrangement, and are not encumbered with unnecessary or useless machinery or appliances.

CORRESPONDENCE SOLICITED.

Chisholm, Boyd & White Company

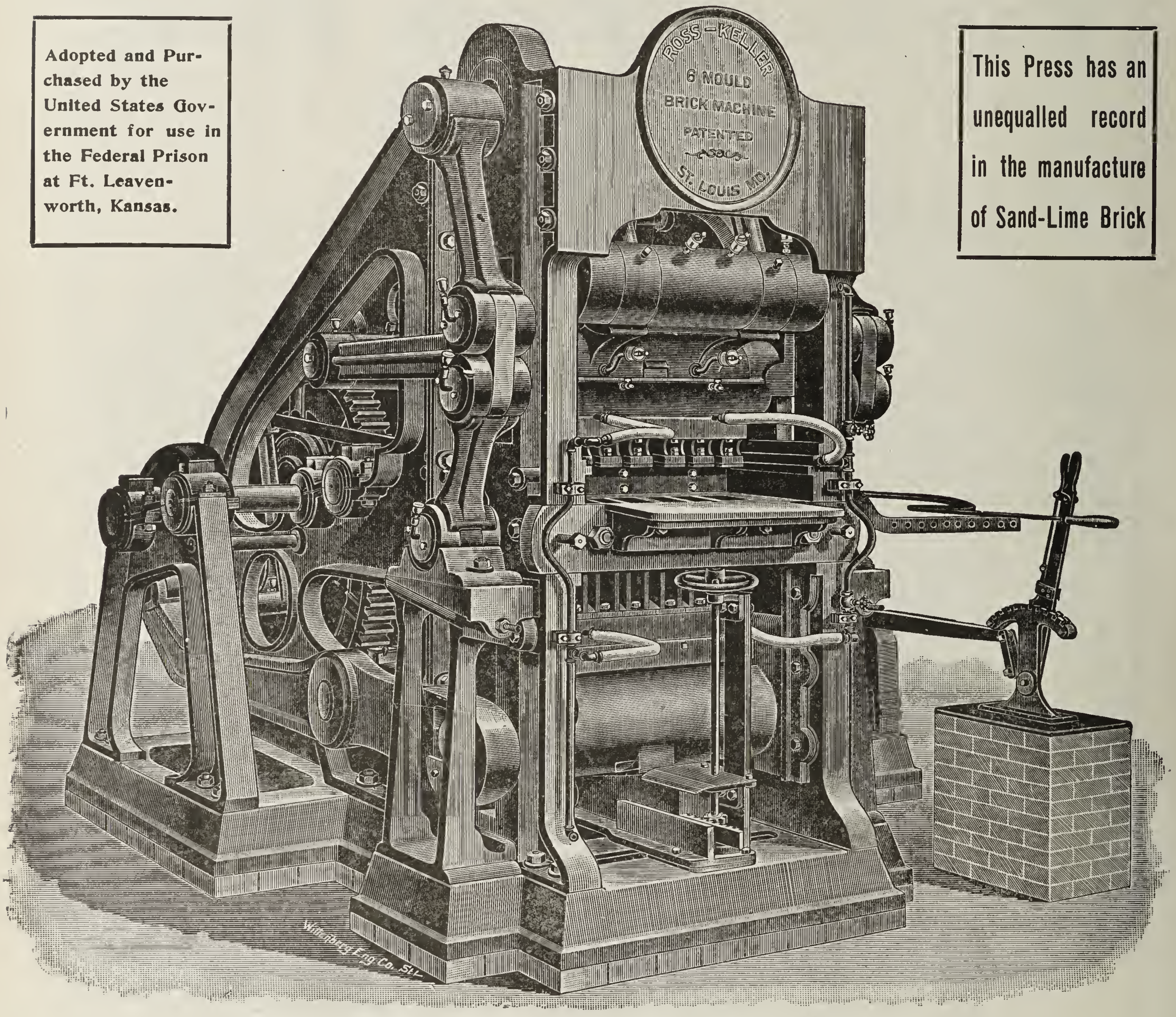
Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

BRICKMAKERS! We wish you a HAPPY NEW YEAR!

Would you increase your profits? Then let us tell you how to improve your Brick! Let us tell you about the Ross-Keller Press! The Press that leads all others!!

Adopted and Purchased by the United States Government for use in the Federal Prison at Ft. Leavenworth, Kansas.

This Press has an unequalled record in the manufacture of Sand-Lime Brick



ROSS-KELLER TRIPLE PRESSURE BRICK MACHINE.

BUILT IN TWO SIZES.

4 mould press has daily capacity of 20,000 to 24,000 brick.
6 mould press has daily capacity of 30,000 to 36,000 brick.

Ross-Keller Triple Pressure Brick Machine Co.

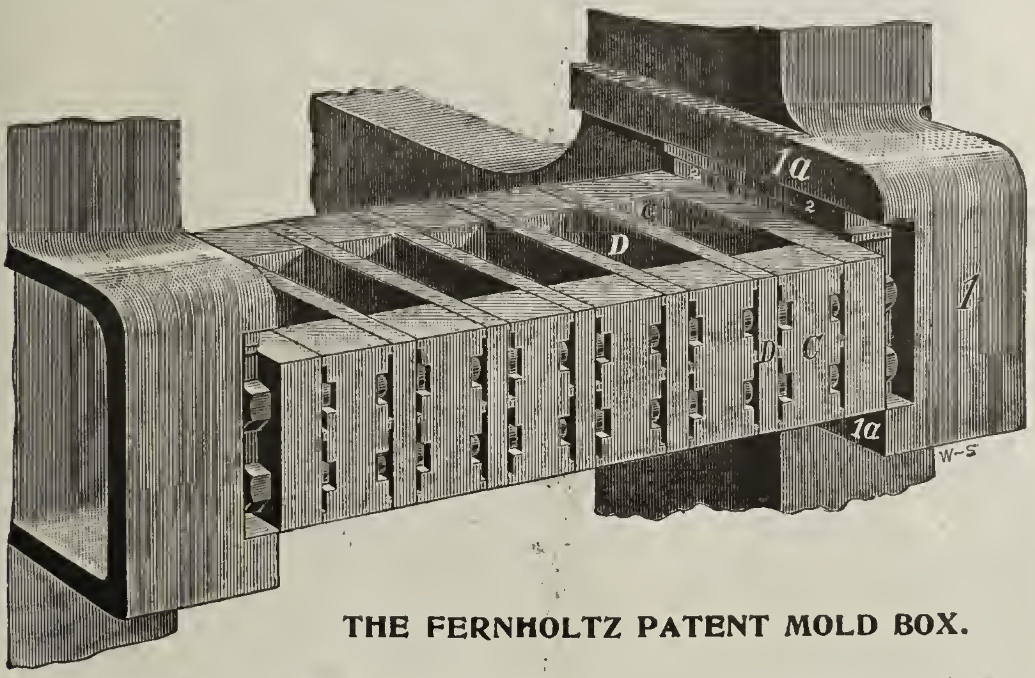
Fullerton Building, ST. LOUIS, MO., U. S. A.

The Fernholtz Brick Machinery Co.

Manufacturers of

The Celebrated Fernholtz Dry Press

Four mold Press 20,000 daily capacity. Six mold Press 30,000 daily capacity



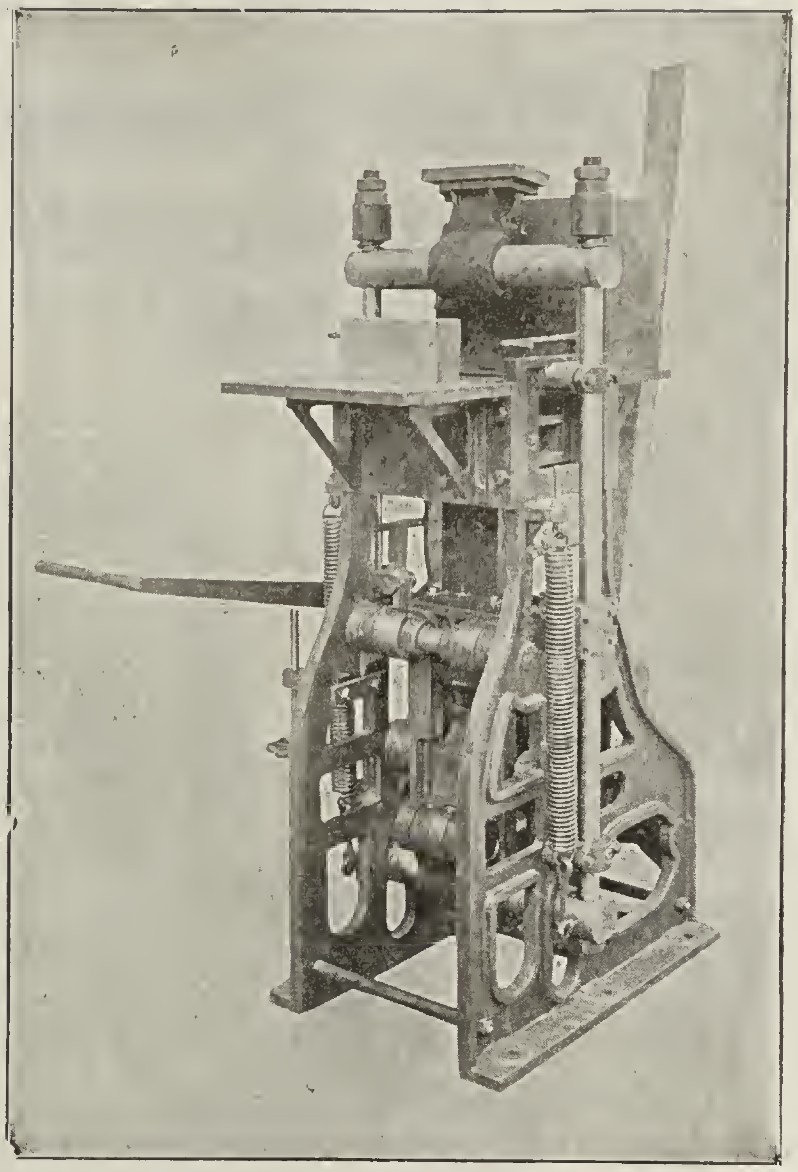
THE FERNHOLTZ PATENT MOLD BOX.

No old style Liners. The Blocks are adjustable and molds are always one size. We have put them in most all makes of Dry Press machines. Easily and quickly adjusted. They are made entirely out of chilled iron, the hardest known metal.

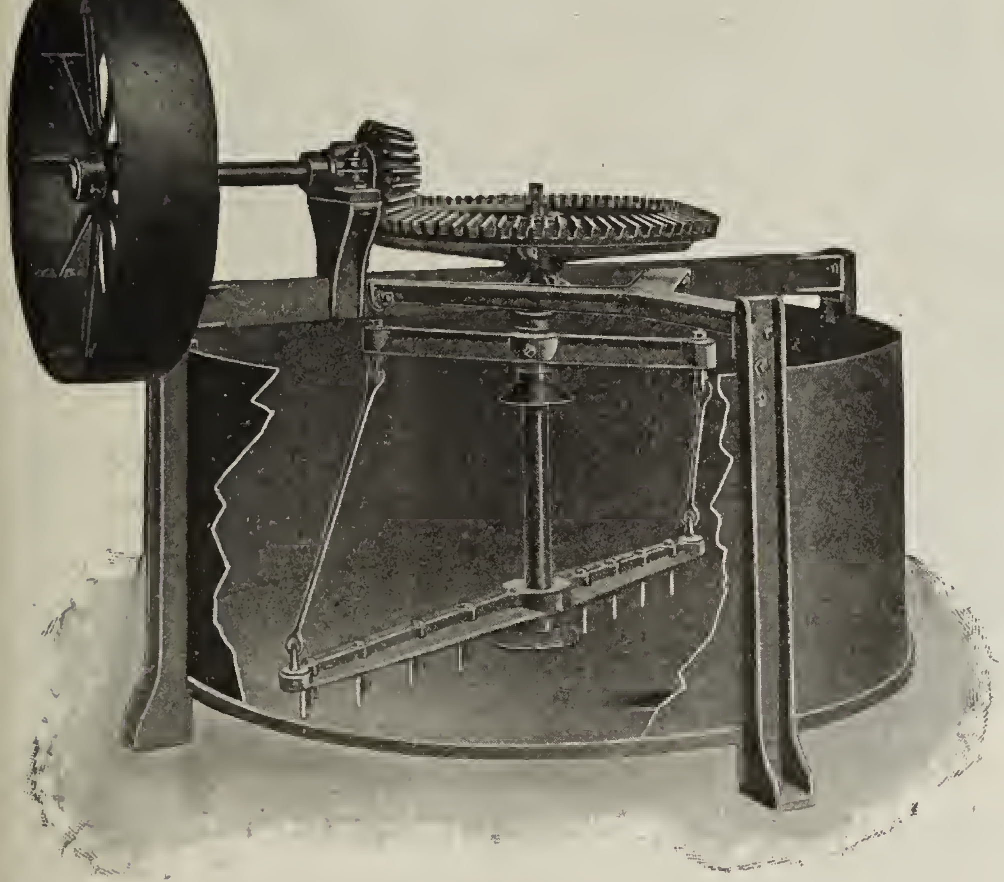
GRATH PATENT HAND POWER PRESS.

Especially adapted for ornamental designs. Any size brick up to 12⅝ inches long, 10 inches wide and 4¼ inches thick.

Brick set into kiln direct from press.



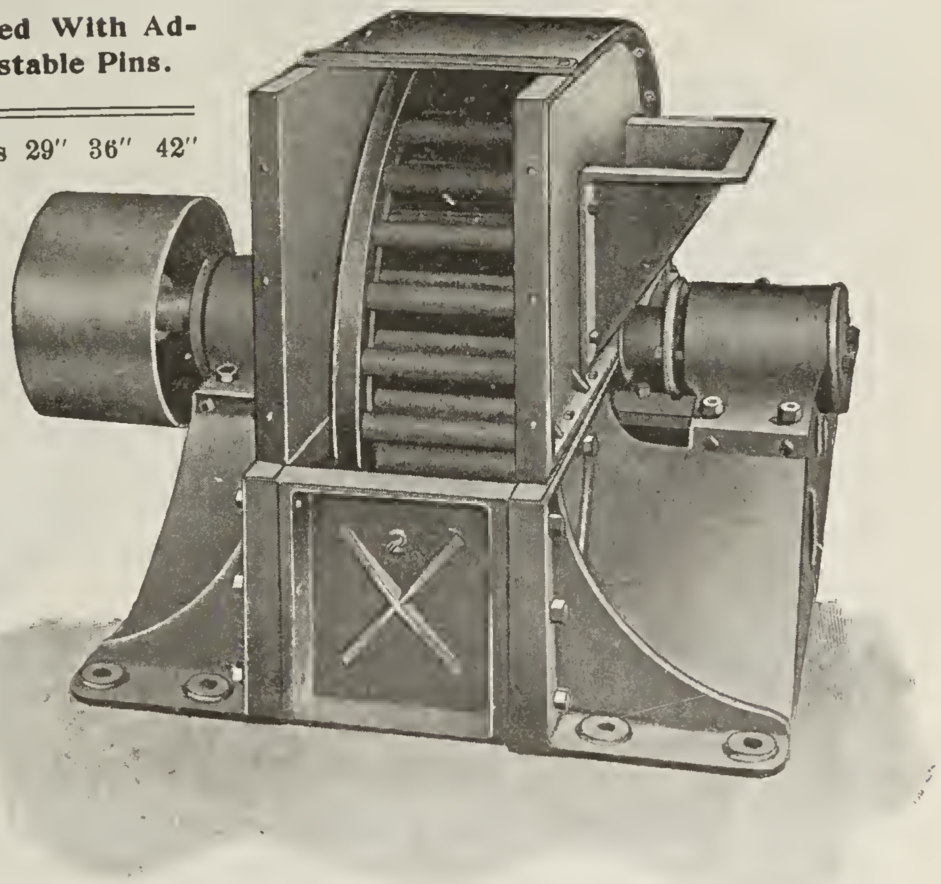
GRATH PATENT HAND POWER PRESS.



A GOOD MIXER IS ALWAYS APPRECIATED.

Fitted With Adjustable Pins.

Sizes 29″ 36″ 42″



THE FERNHOLTZ CLAY PULVERIZER.

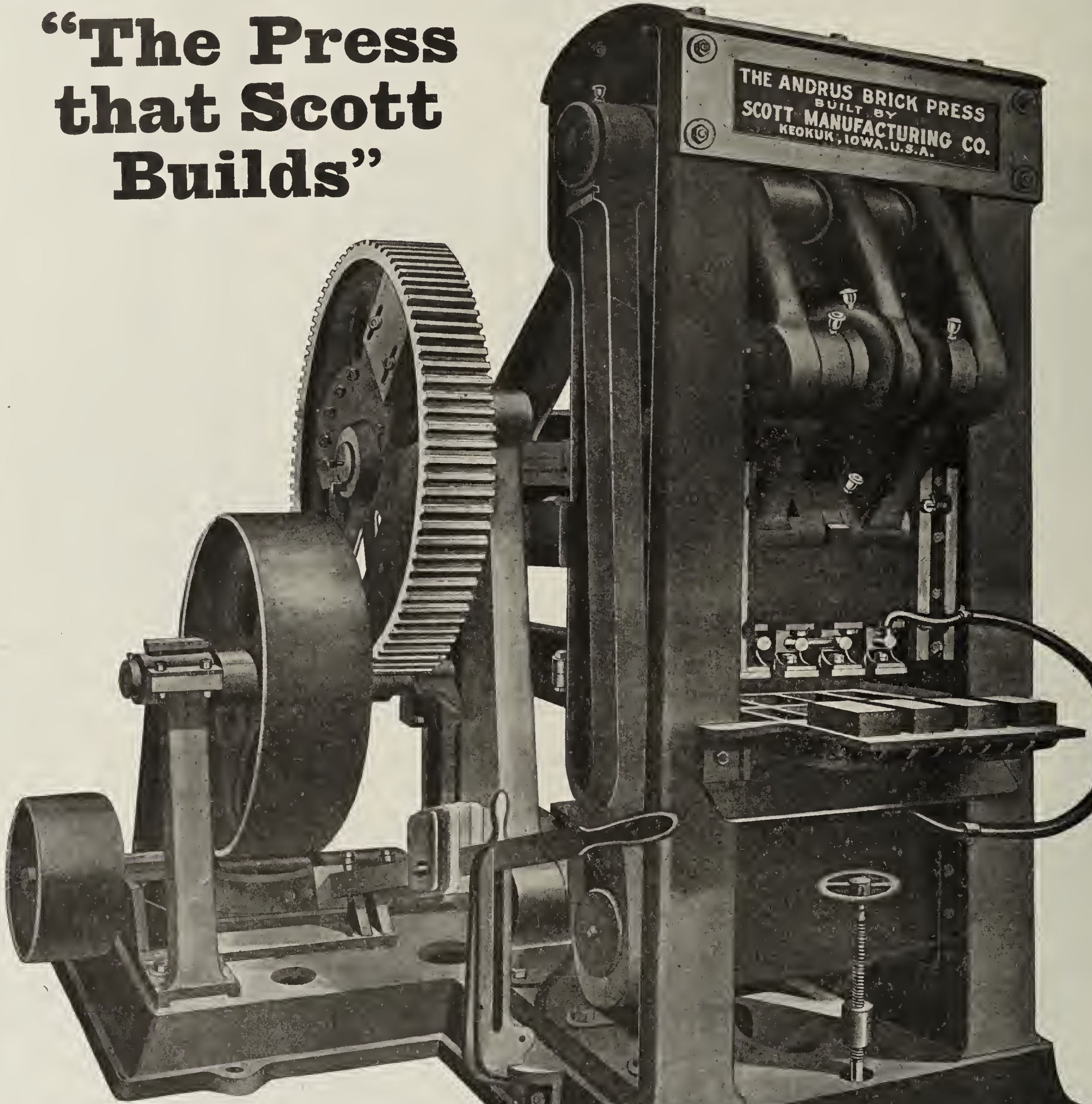
The Fernholtz Brick Machinery Co.

Cable Address "Fernbrick." Western Union Code.

Boyle Avenue and Old Manchester Road, ST. LOUIS, MO., U. S. A.

One Glance Ought to Convince You

"The Press that Scott Builds"



"Makes Brick every day" because it never takes time to lay up for repairs.

SCOTT MANUFACTURING COMPANY

Works: Keokuk, Iowa. *ST. LOUIS, MO.*

Call and see us in our new office, 609-610 Commonwealth Trust Building.

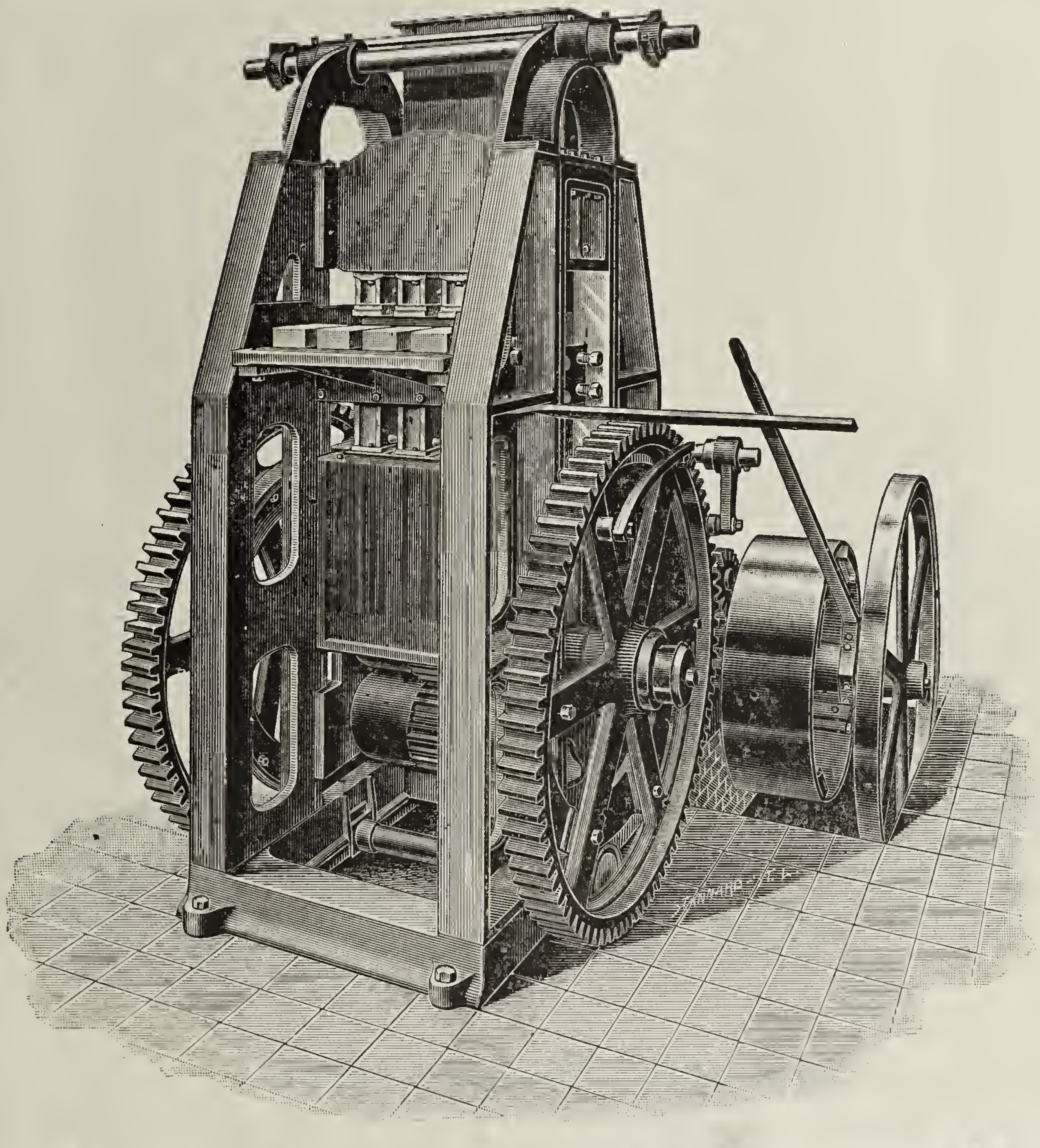
PERFECTION REALIZED

IN THE

RELIANCE DRY PRESS BRICK MACHINE

(PATENTED)

Main
Features:
Strength
Durability
Simplicity
Saves Fuel
and
Costs Less



No
Toggles
No
Links
No
Pins
to
Wear

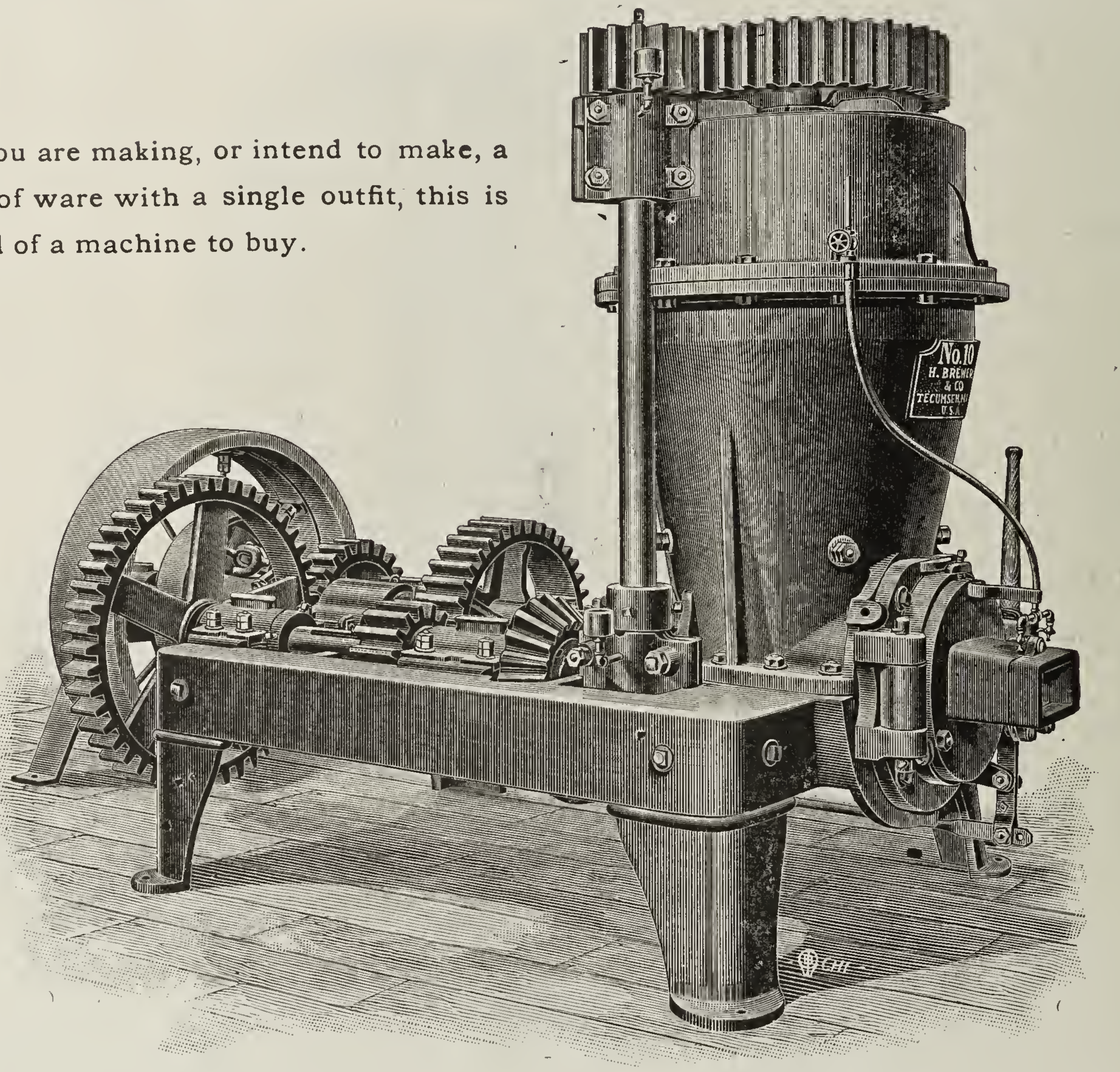
STRONGEST AND MOST POWERFUL BRICK PRESS ON THE MARKET

FOR PRICES AND FURTHER PARTICULARS ADDRESS THE

RELIANCE MACHINE AND TOOL WORKS
ST. LOUIS, MO.

COMBINED
BRICK TILE AND HOLLOW BLOCK
MACHINES

If you are making, or intend to make, a variety of ware with a single outfit, this is the kind of a machine to buy.



There Are Three Sizes

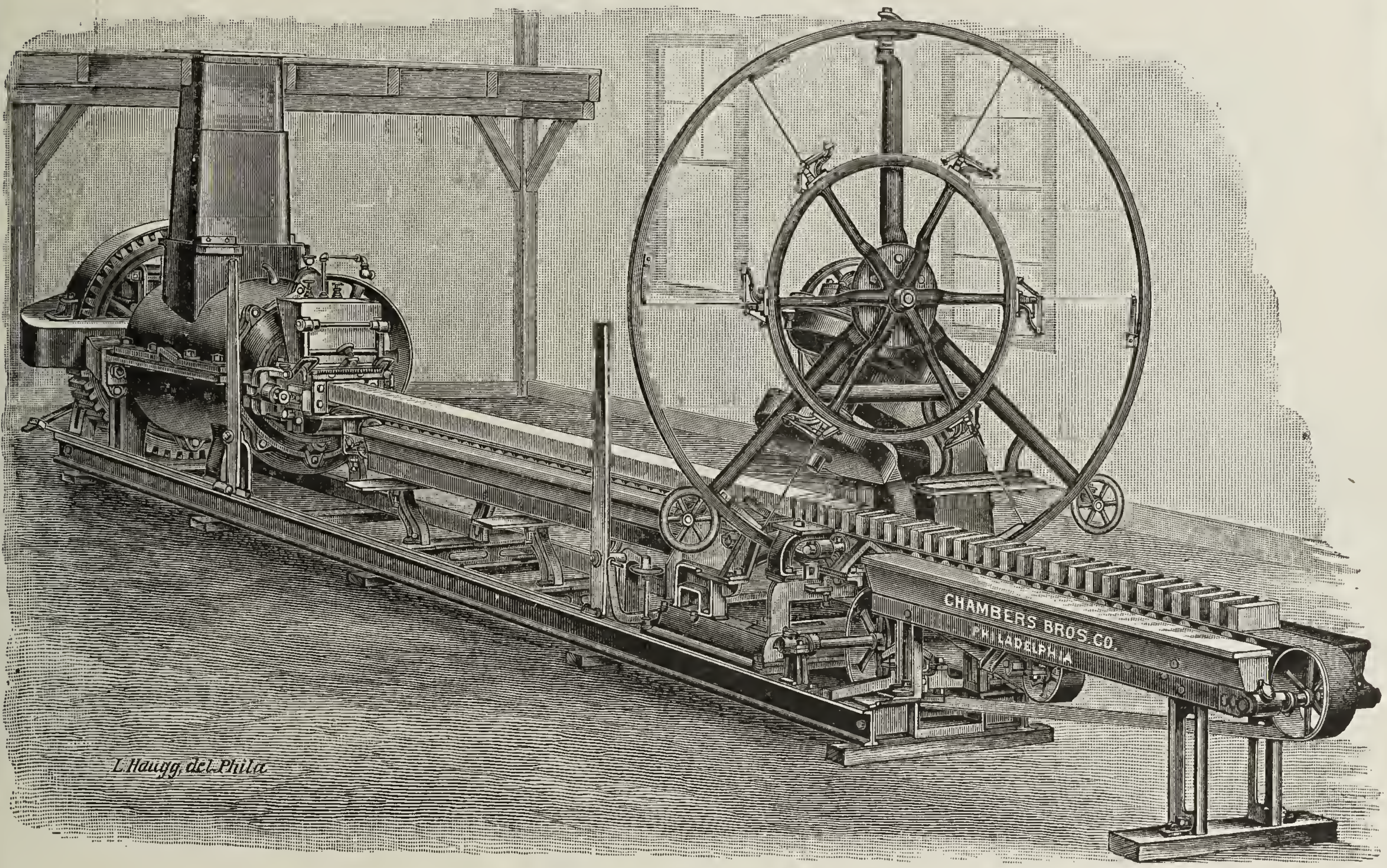
To select from, one of which will suit the profitable operation of your plant whether the output is great or small. Ask for catalogs and references.

H. BREWER & CO., TECUMSEH,
MICHIGAN.

MACHINERY FOR BUILDING BRICK

AND FOR STREET PAVERS

ROUND CORNER PAVING BRICK WITHOUT REPRESSING


CHAMBERS BROS. CO.
PHILADELPHIA
L. Haugg, del. Phila.

THE CHAMBERS AUTOMATIC SIDE-CUT BRICK MACHINE.

Automatic End Cut Brick Machines of five sizes, having capacity from 10,000 to over 100,000 brick daily under favorable conditions.

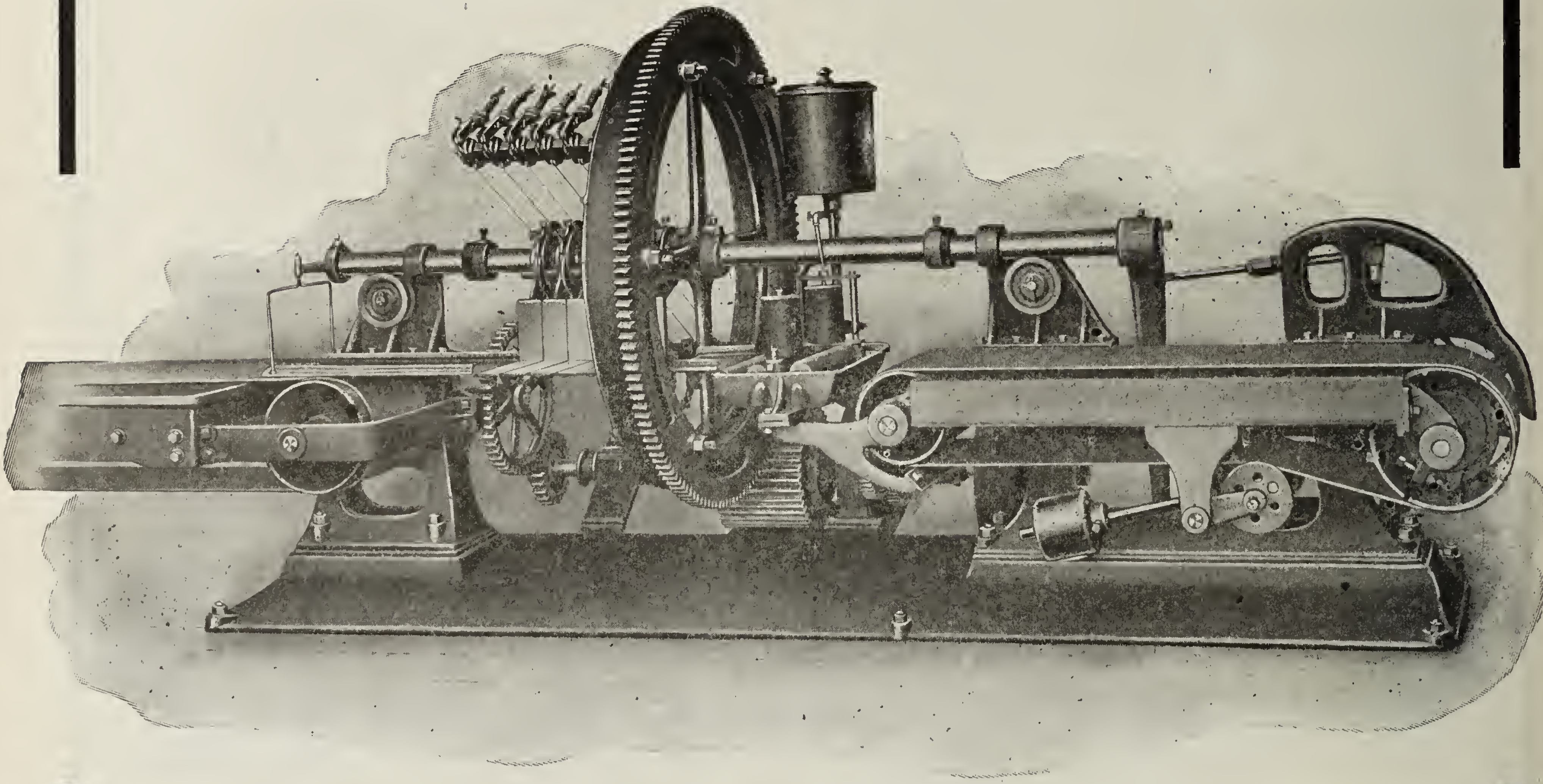
CHAMBERS BROTHERS COMPANY
52D AND MEDIA STREETS
PHILADELPHIA, PA.

E. R. FRAZIER, Chicago Agent,
59 West Jackson Boulevard.

REVOLUTION IN

Automatic Cutters

Simple, Accurate, Light Running, Continuous Motion, Perfect Brick.



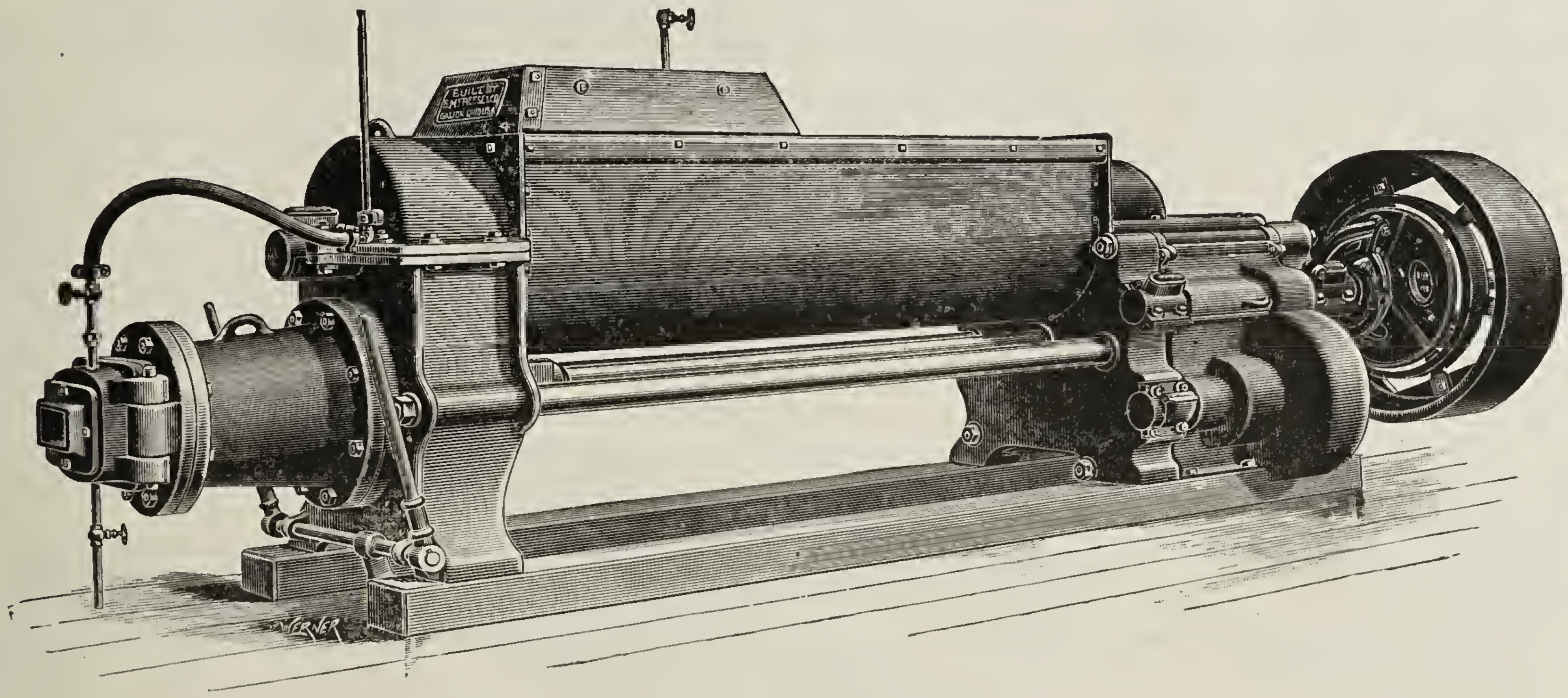
No. 25 Automatic Side Cut Brick Cutter.

THERE has never been introduced to the trade such a combination of excellent features, simplicity, accuracy and durability, as those embodied in our No. 25 Cutter. This cutter is beyond doubt the biggest value in cutters on the market today. Send for complete description. Our new catalogue is ready for distribution. If you haven't a copy send for one. It gives full information regarding our complete line of Dry Press, Stiff Mud and Soft Mud Brick Machinery, Roofing Tile Machinery, Sewer Pipe Machinery, Sand Lime Brick Machinery, Cement Machinery, Waste Heat. Steam and Hot Air Dryers and every appliance used in the clay trade.

The American Clay Machinery Co.

BUCYRUS, OHIO, U. S. A.

UNION BRICK MACHINES



We build these Machines in five sizes. Capacities to 10,000 brick per hour.

Several hundred are in everyday use. They do first-class work and are convenient, economical and durable. This can be verified by investigation.

We also build Brick Machines with separate Pug Mill.

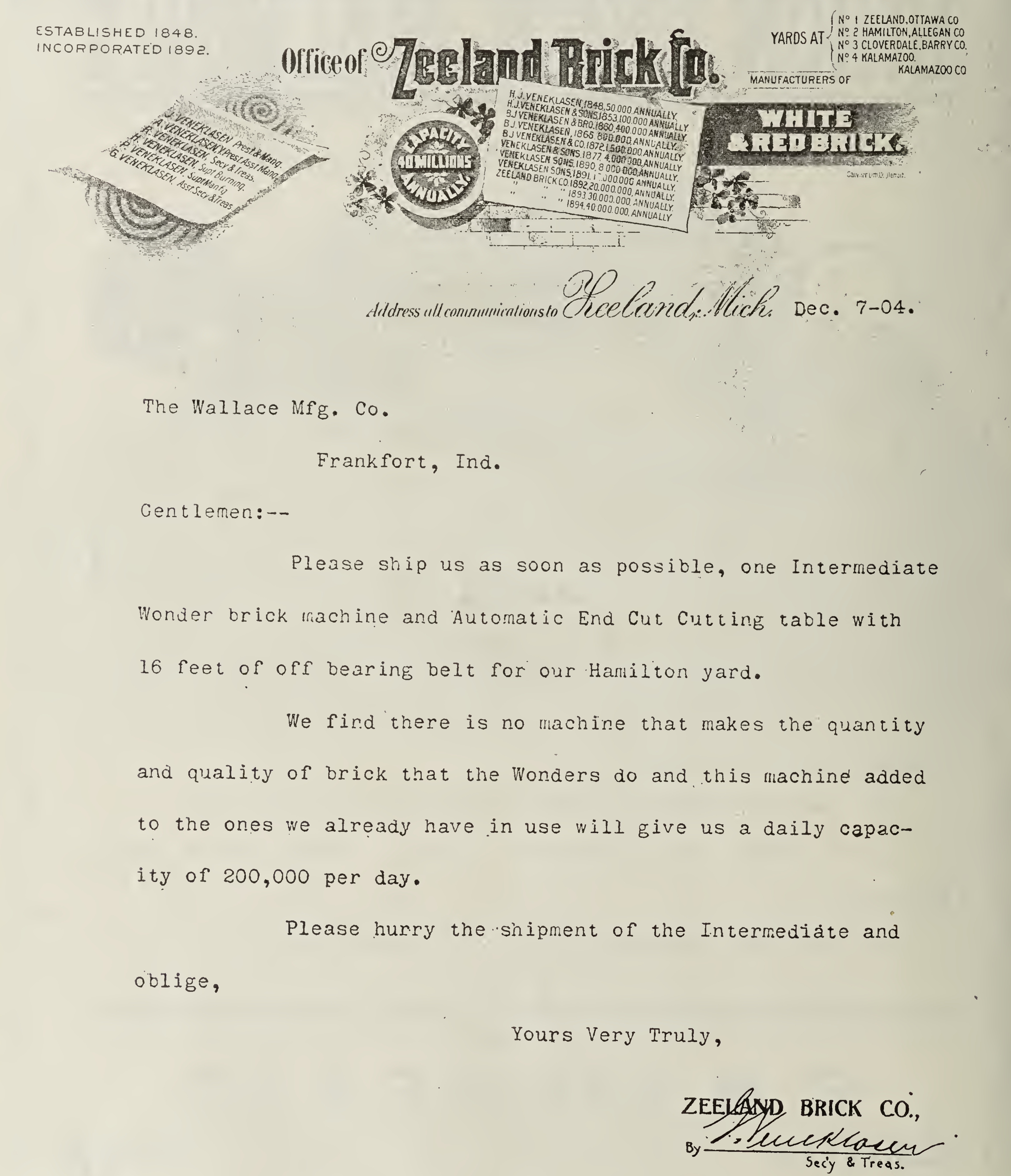
Don't forget our Automatic Cutters. **They give satisfaction.**

State your requirements and let us furnish particulars.

E. M. FREESE & CO.

GALION - - - - OHIO

WE PAVE THE WAY TO PROSPERITY.



ESTABLISHED 1848.
INCORPORATED 1892.

Office of Zeeland Brick Co.

YARDS AT
Nº 1 ZEELAND, OTTAWA CO
Nº 2 HAMILTON, ALLEGAN CO
Nº 3 CLOVERDALE, BARRY CO.
Nº 4 KALAMAZOO. KALAMAZOO CO

MANUFACTURERS OF WHITE & RED BRICK.

J. VENEKLASEN, Prest. & Mang.
A. VENEKLASEN, V. Prest. Asst. Mang.
R. VENEKLASEN, Secy & Treas.
H. VENEKLASEN, Supt. Burning.
P. VENEKLASEN, Supt. Manfg.
G. VENEKLASEN, Asst. Secy & Treas.

CAPACITY 40 MILLIONS ANNUALLY.

H. J. VENEKLASEN, 1848, 50.000 ANNUALLY.
H. J. VENEKLASEN & SONS, 1853, 100.000 ANNUALLY.
B. J. VENEKLASEN & BRO. 1860, 400.000 ANNUALLY.
B. J. VENEKLASEN, 1865, 800.000 ANNUALLY.
B. J. VENEKLASEN & CO. 1872, 1.500.000 ANNUALLY.
VENEKLASEN & SONS. 1877, 4.000.000 ANNUALLY
VENEKLASEN SONS, 1890, 8.000.000 ANNUALLY.
VENEKLASEN SONS, 1891, 1[illegible].000.000 ANNUALLY.
ZEELAND BRICK CO. 1892, 20.000.000, ANNUALLY.
" " " 1893, 30.000.000, ANNUALLY.
" " " 1894, 40.000.000, ANNUALLY

Address all communications to Zeeland, Mich. Dec. 7-04.

The Wallace Mfg. Co.

Frankfort, Ind.

Gentlemen:--

Please ship us as soon as possible, one Intermediate Wonder brick machine and Automatic End Cut Cutting table with 16 feet of off bearing belt for our Hamilton yard.

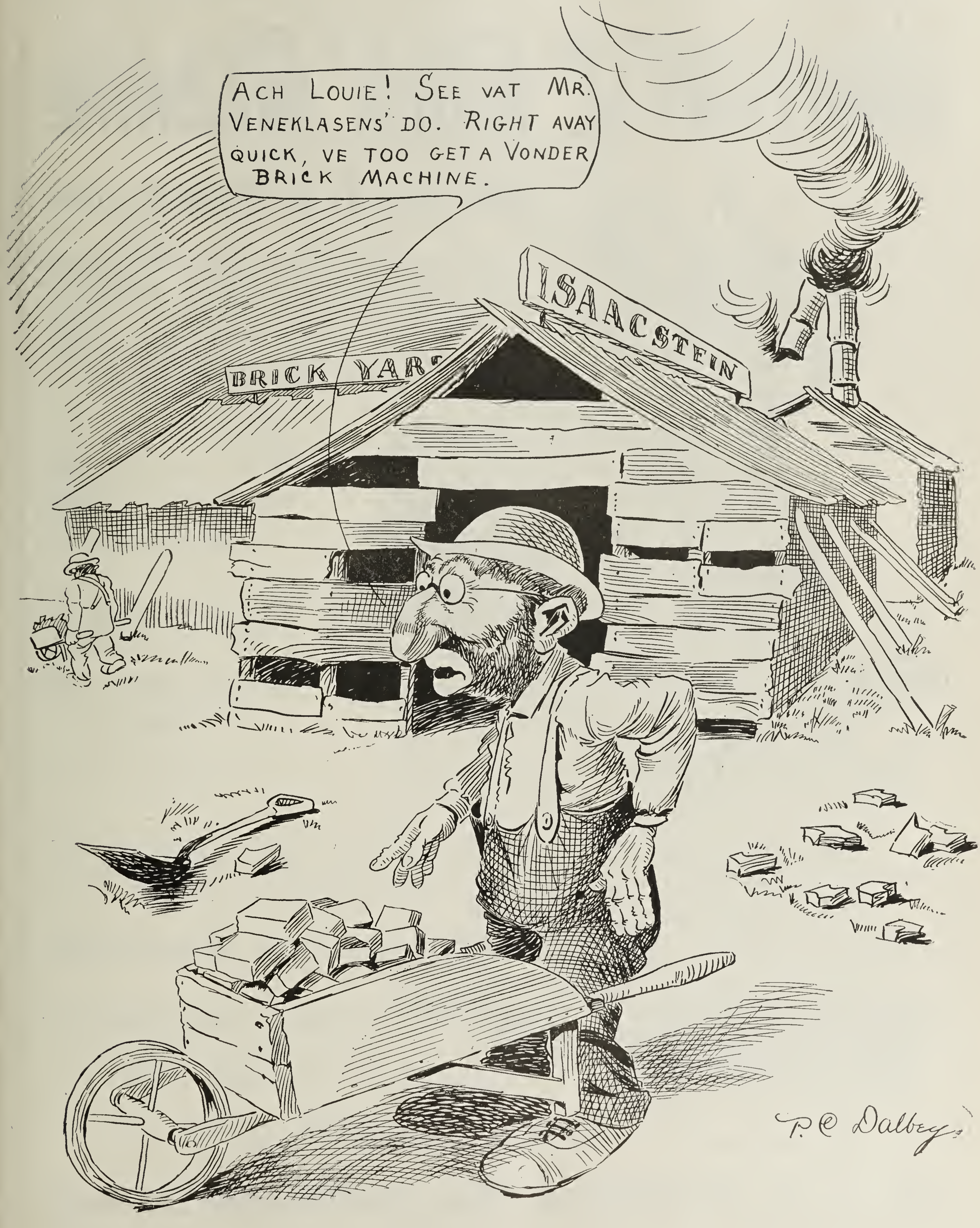
We find there is no machine that makes the quantity and quality of brick that the Wonders do and this machine added to the ones we already have in use will give us a daily capacity of 200,000 per day.

Please hurry the shipment of the Intermediate and oblige,

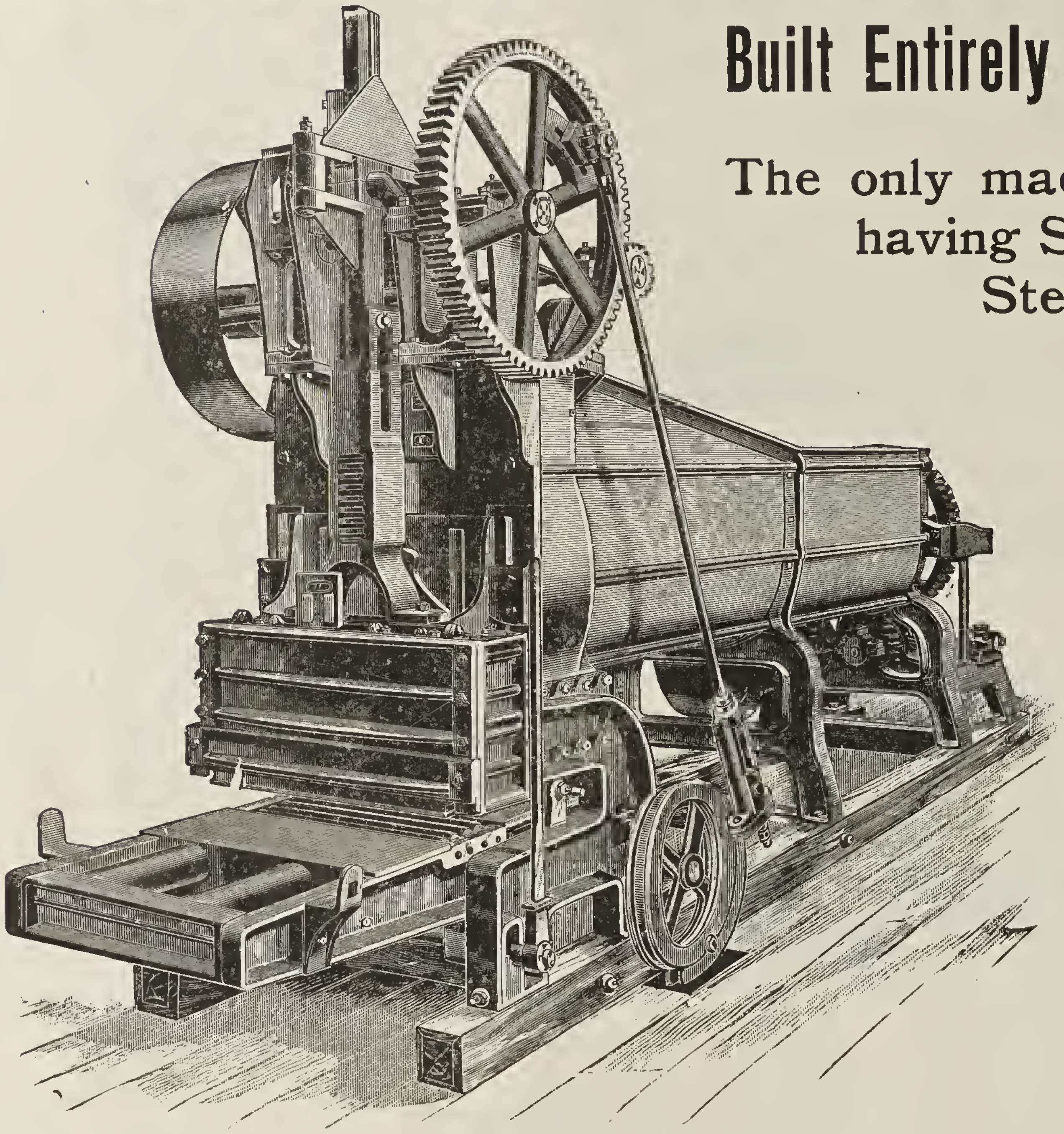
Yours Very Truly,

ZEELAND BRICK CO.,
By
Sec'y & Treas.

The Wallace Mfg. Co., Frankfort, Ind., U. S. A.


ACH LOUIE! SEE VAT MR. VENEKLASENS' DO. RIGHT AVAY QUICK, VE TOO GET A VONDER BRICK MACHINE.
ISAACSTEIN
BRICK YARD
P. C. Dalbey

THE POTTS
HORIZONTAL BRICK MACHINE



Built Entirely of Iron and Steel.

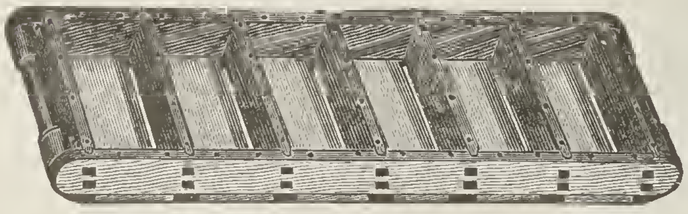
The only machine of this class
having Steel Gear and
Steel Shaft.

Built of the Best
Material by the Best
Workmen.

Simple, Strong and
Durable.

No extra pug mill required to enable working the clay direct from the bank. Its great strength enables working the clay as stiff as practicable, insuring brick which will be STRAIGHT and SQUARE.

THE LEADER OF ALL SAND MOULD MACHINES.



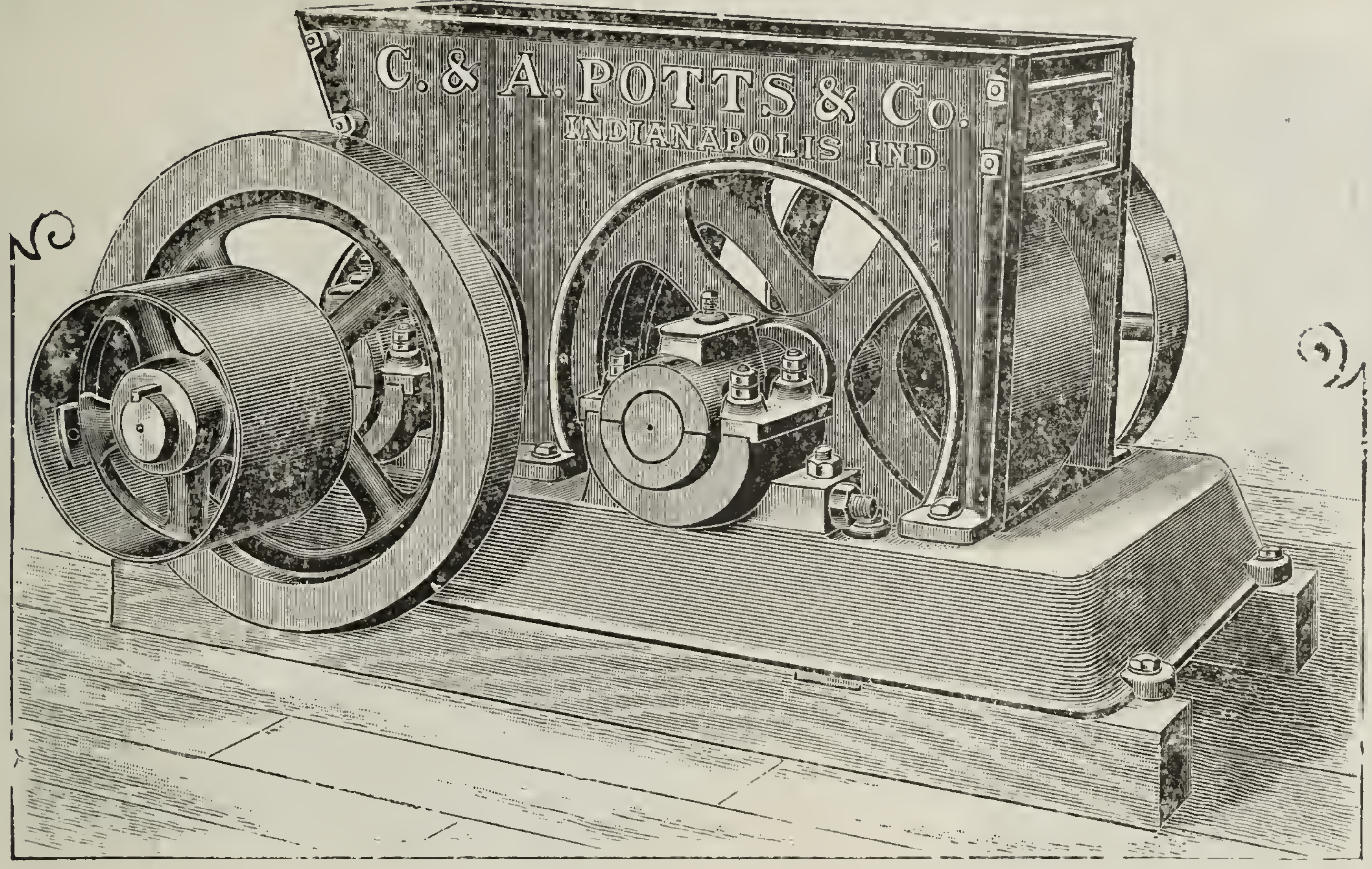
BRICK MOULDS A SPECIALTY

QUALITY IS OUR AIM.

We manufacture a complete line of Brick Yard Supplies. Write for prices.

C. & A. POTTS & CO., Indianapolis, Ind.

THE POTTS DISINTEGRATOR


C. & A. POTTS & Co.
INDIANAPOLIS IND.

Is not a spite machine, but is built the best possible. Having Heavy Chilled Rolls, Ring Oiling Bearings, Shafts of Steel and large in Diameter. The most successful machine for grinding out sticky clays and separating the stone.

THE POTTS MOULD SANDER

Simple in Construction,

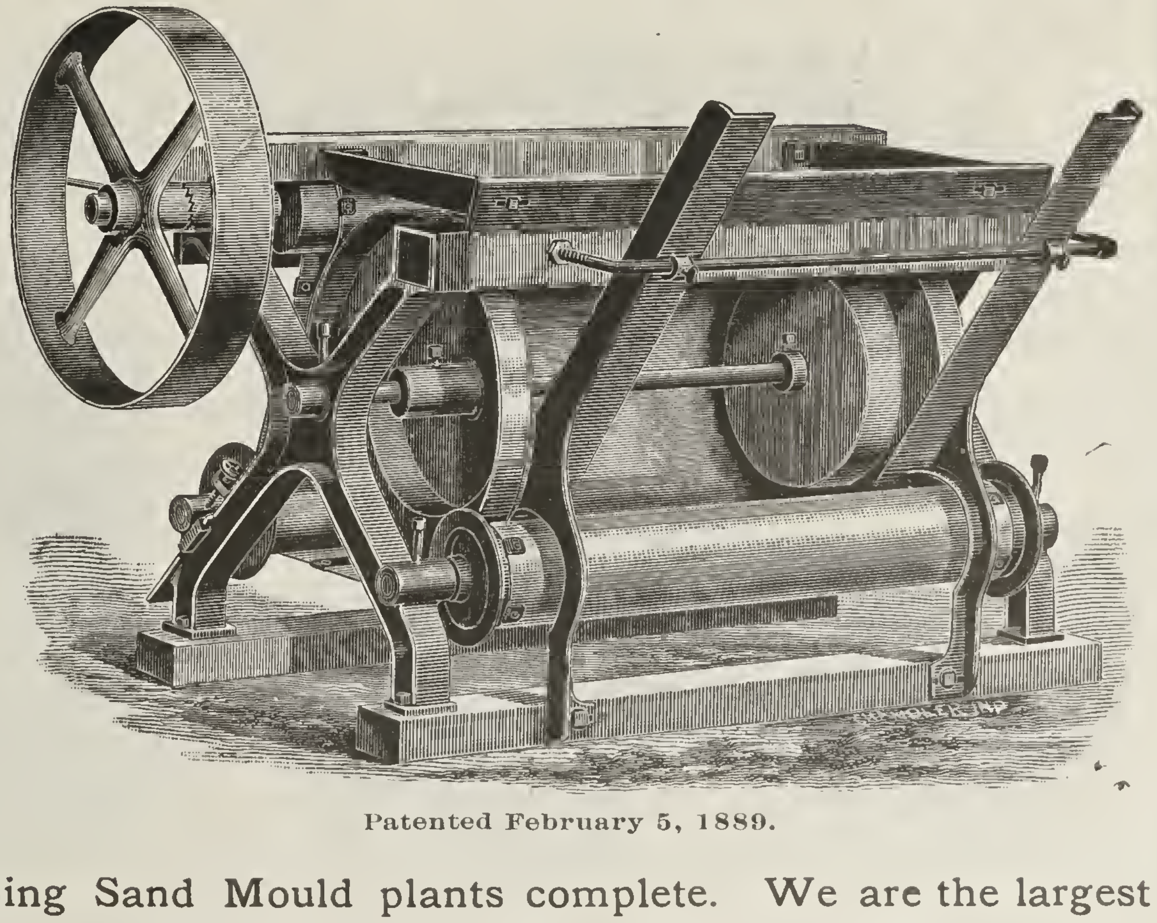
Strong and Durable,

Sands the Moulds Perfectly,

Never Strikes or gets Drunk,

Always Ready for Work,

No Brick Machine Complete without this Machine.



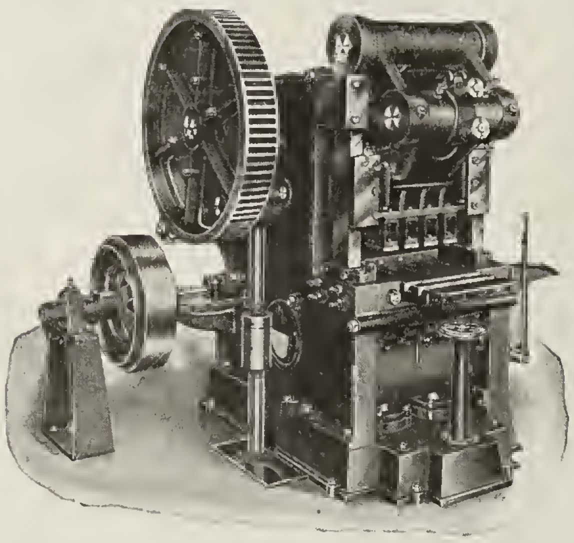
Patented February 5, 1889.

We make a specialty of equipping Sand Mould plants complete. We are the largest manufacturers of this class of machinery in the world. Write for prices.

C. & A. POTTS & CO., Indianaoplis, Ind.

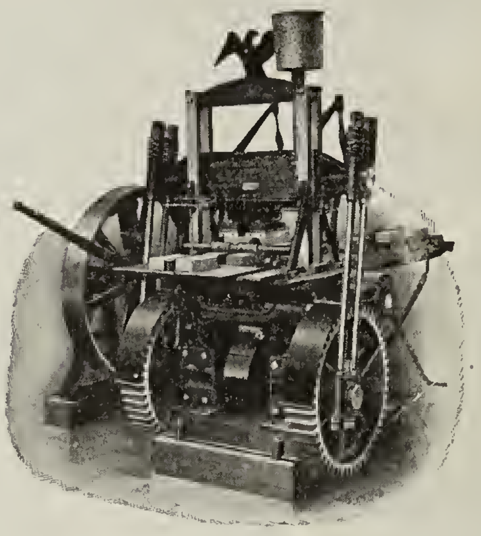
The American Clay Machinery

These are a few of the many Superior machines we manufacture for the Clay Trade. Large cuts



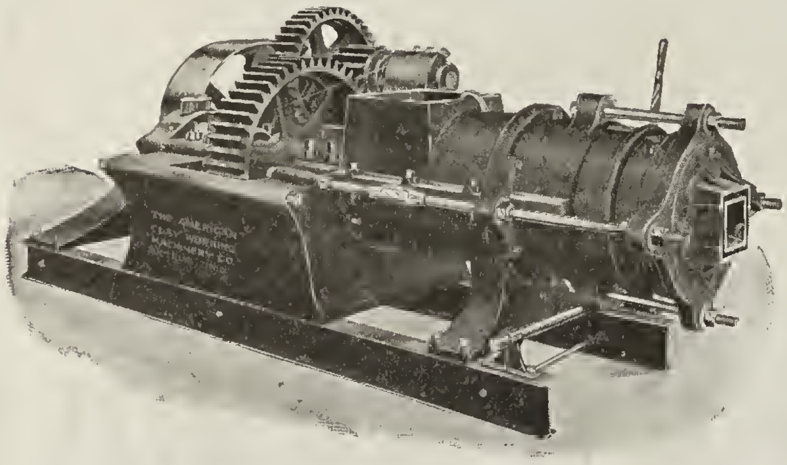
DRY PRESS BRICK MACHINERY.

We build a full line of Dry Press brick machinery. We have four styles and eight sizes, ranging in capacity from 1,000 to 3,000 brick per hour. This cut is our four mold, Moldel B press, especially adapted to Sand-Lime brick. Write for complete catalogue.

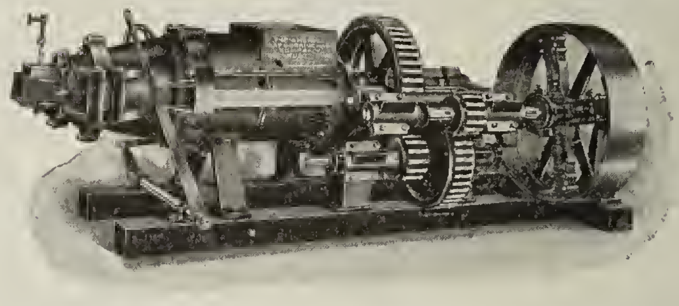


REPRESSES.

We build a large and complete line of represses in six sizes and styles. Capacity runs from 600 to 2 500 brick per hour. Send for our complete catalogue. This cut is of our double mold Eagle Repress.

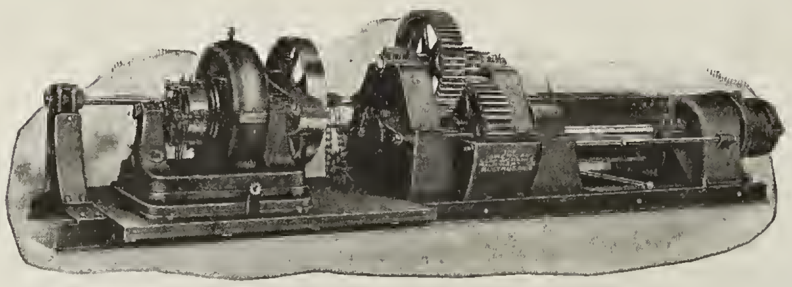


No. 40 AUGUR MACHINE FOR HOLLOW WARE.



No. 2 GIANT AUGER BRICK MACHINE.

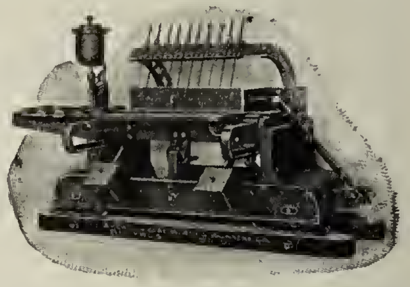
We build ten sizes and styles of Auger Machines. Capacities 1,500 to 10,000 brick per hour. Write for complete list.

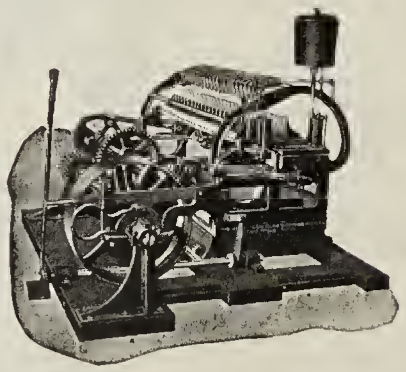


No. 23 ELECTRICAL DRIVEN, LOW FRAME, COMBINED MACHINE.

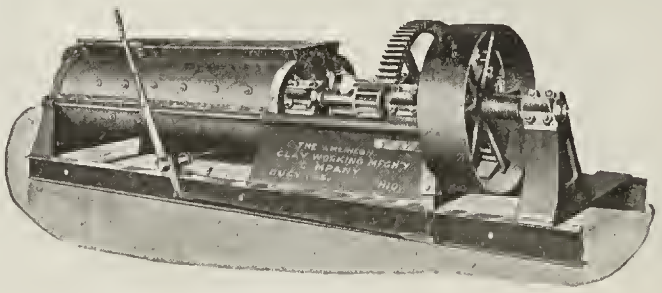
We make a full line of electrical driven clay-working machinery. Send for catalogue.

SEMI-AUTOMATIC AND HAND POWER CUTTERS





We make twenty-five styles of semi-automatic and hand power cutters for brick, tile and hollow ware. Write for full list and description.



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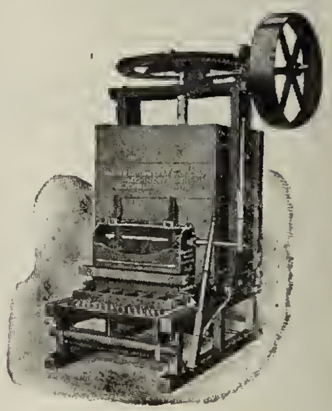

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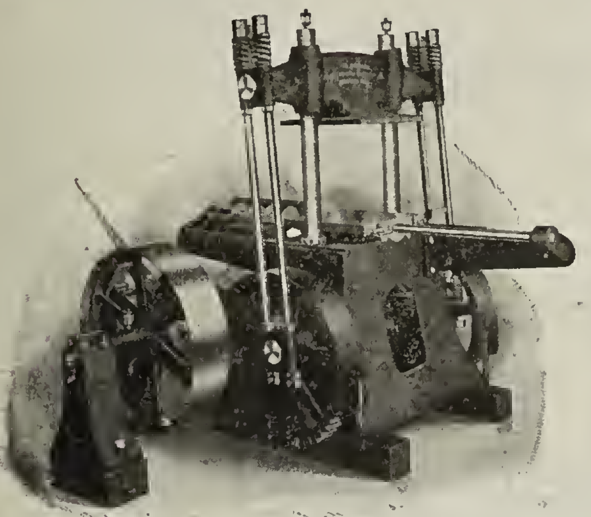

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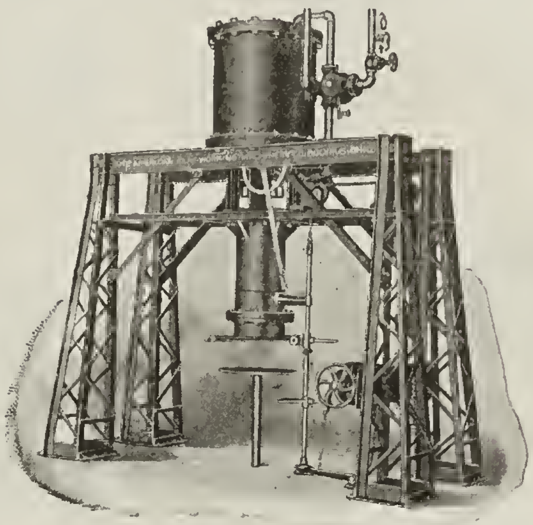

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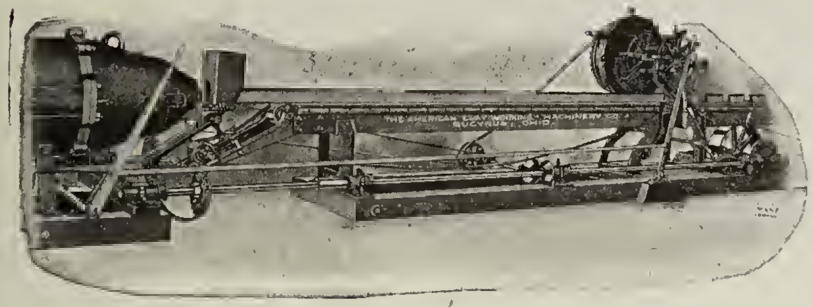

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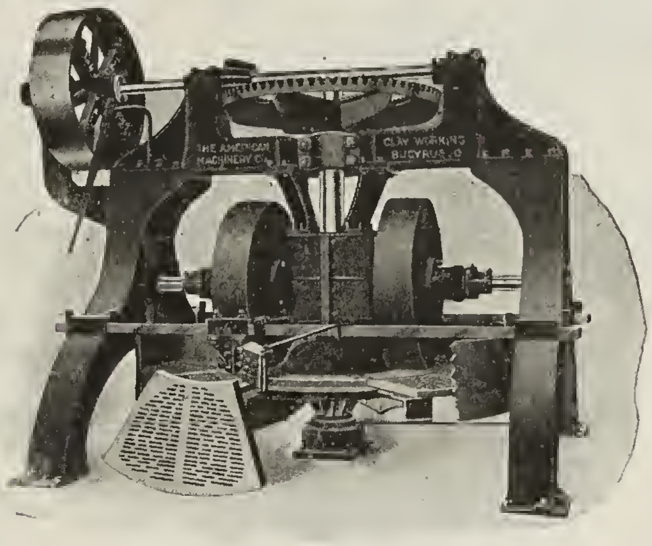

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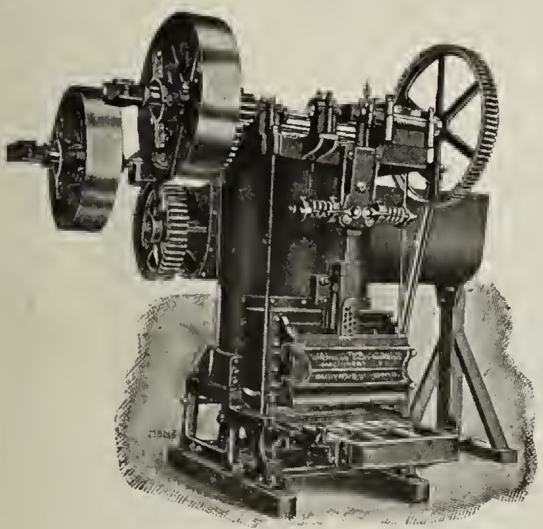

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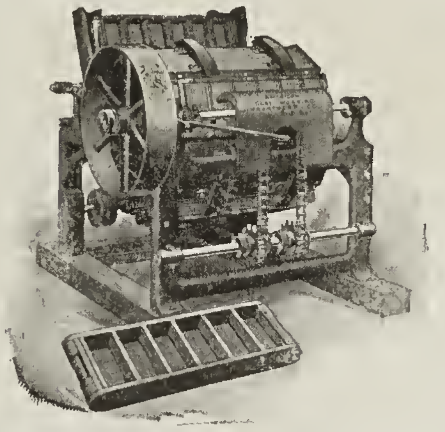

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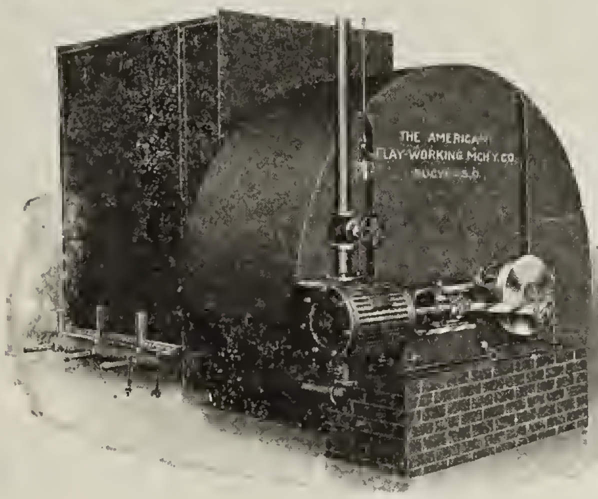

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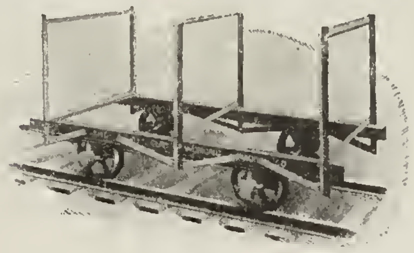

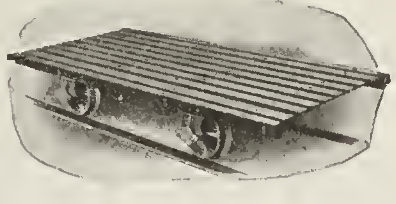

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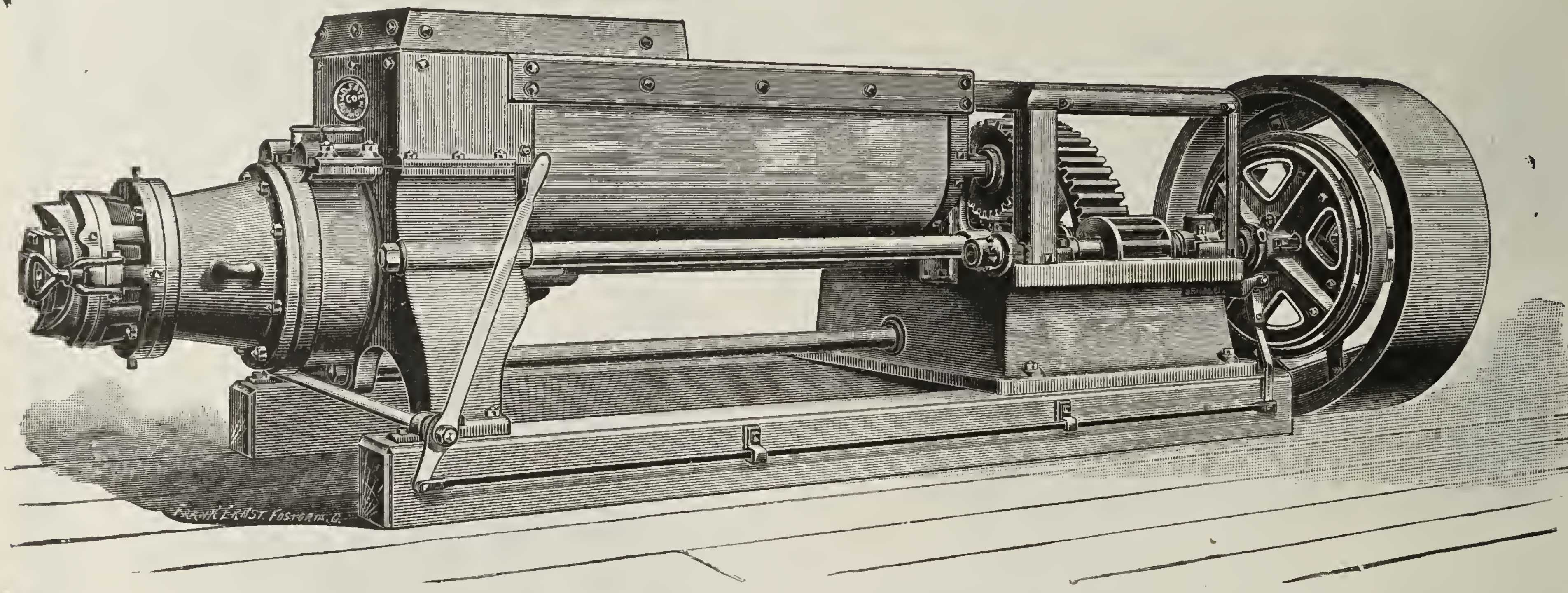
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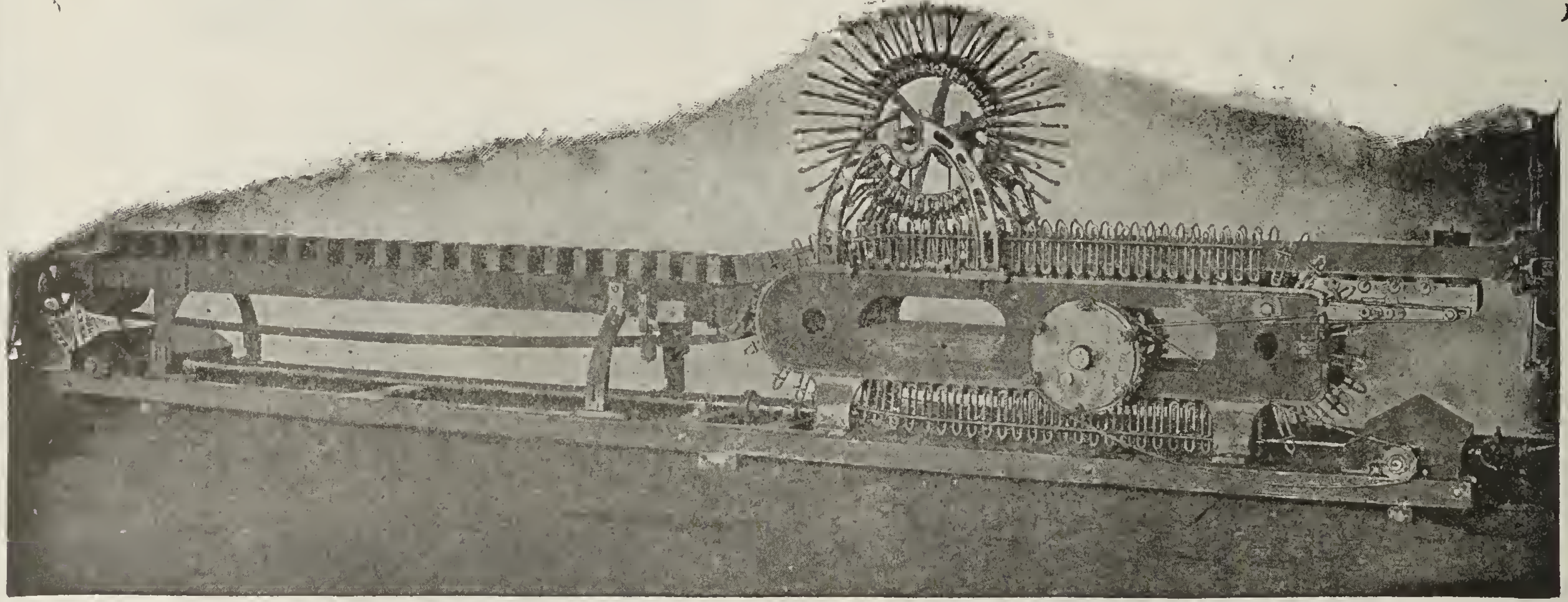

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CLAY RECORD

Vol. XXVI. No. 3. CHICAGO, FEBRUARY 14, 1905. Semi-Monthly, $1.00 per Year
Single Copies, - 10 Cents

THE TESTING OF CLAY.*

By Prof. Edward Orton, Jr., Columbus, O.

It is natural with every prospective investor in the clay industry to desire to know as much as possible of the materials with which he is to work, before risking his money. The ordinary dictates of caution and conservatism would lead him to this conclusion in any investment, and I think capitalists, as a rule, especially insist on this precaution when dealing with a clay manufacturing proposition. In fact, the clay industries have a rather bad name among capitalists, on account of the numerous failures, or, I might almost say, few successes which are found among new clay industries. It is not uncommon to hear people say a clay industry must fail one or more times before success is probable.

In view of this situation, the question arises—What can we do to ascertain the nature of the material with which we are to deal? How can we guard against these preliminary failures which have become proverbial? Have capitalists not availed themselves of expert information? Or, if they have attempted to do so, is there no expert information to be had? If so, why have the results been so unsatisfactory? It is my purpose on this occasion to lay before you the situation as it appears to me, after an experience of ten years or so, largely spent in the study of clays. Clay testing may be approached from the two different standpoints—the Chemical and the Empiric. Both have been used in the past, but neither has been so used as to develop its fullest usefulness.

Chemical Testing.

This was the first recourse of the scientist when approached on the subject. Practical men have tested clay for a long time in their own way, but when they went to the chemist the analysis was held up as the only true and infallible way. Analyses of clay have been made by the hundreds, nay, by the thousands, and yet the failures go on about as before. What, then, is the nature of the result reached by these chemical tests? When we consider them carefully, we find there are three different kinds of chemical tests.

Ultimate Analysis.

The first and most used chemical test is the ultimate chemical analysis. In making this analysis we resolve the clay into its chemical constituents, silica, alumina, iron, lime, magnesia, the alkalies, and water. We pay no attention to the form in which these elements may be linked together in the original clay, but we proceed to break it down as the very first step of analysis, get it all into solution, and then to precipitate out one element after another. This process as applied to clays is the ordinary process applied to all other materials to be analyzed. It gives an accurate conception of the amounts of the various elements present. It does what it pretends to do, but after all, I think I may fairly say that this method of testing has failed to demonstrate any great or widely extended field of usefulness in the clay industry.

PROF. EDWARD ORTON, COLUMBUS, OHIO

What is it? I think it lies in the fact that in the clay industry we seldom carry our manufacturing process to the actual melting of the clay. We only go part way in that

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Read at the Birmingham meeting of the N, B. M. A., February, 1905.

process, and bring the clay to a stony hardness. The ultimate analysis would be much more useful if we used it as a means of judging the actual melting point of the clay. When we study the quality of a slag or a refractory material we find that the ultimate analysis answers very well, because the whole idea of the slag is to melt at a given temperature, and of the refractory material is to resist fusion at any temperature. The behavior of the clay to fuse or resist fusion is indicated fairly well by its chemical analysis. The metallurgist and the glass manufacturer use chemical analysis for such purposes all the time and with very good success, because in the processes the ultimate composition is the critical feature. With ordinary clay manufacture, however, this is not the case. Our chemists have been trying for years past to explain the behavior of clays on vitrification, but have provided themselves with information which is only sufficient to give an answer for fusion. As a result, where a chemist has tried to predict the behavior of a clay, he has usually failed. Or, if of a diplomatic nature, he has confined himself to making his analysis and collecting his fee, and has allowed the clayworker to make his own interpretation as to what the analysis meant. As a result, therefore, chemists and chemical testing have often fallen into ill-repute among clayworkers, and all because they have tried to make use of the ultimate analysis in a way which it does not permit.

Rational Analysis.

The second method of chemical analysis is the proximate or mineral analysis. It is founded on the idea that a clay is a mixture of a number of minerals, each of which has a definite chemical composition of its own, and definite physical properties, so that the properties of the clay are the resultant, or sum, of the properties of its constituent minerals. When we analyze a clay and report it in terms of its chemical elements, we do not gain any exact idea of the way these elements are linked together, but when we can find out the mixture of the minerals, we can tell what the clay is and what it will do. Therefore, it would seem if we can devise a process of mineral analysis we will be far better able to make valuable conclusions than ever before.

Without going into the methods of mineral analysis, I may say that a method has been devised, largely through the researches of Dr. Seger, by which we can separate some three or four of the principal component minerals of clays from each other. When we are dealing with white burning clays, such as the kaolins, ball-clays, and china-clays of commerce, or the bodies compounded for the manufacture of white-ware and porcelain, it is now possible to arrive at a very close approximation to the actual proportions in which these minerals exist. Hence, for such clays, the rational analysis enables us to form an accurate conception of their properties and probable behavior.

But, unfortunately, the white-burning clays and the artificial clay bodies made from them, constitute but a small minority in the field of clay manufacture. The vast bulk of clay wares are made of red or buff colored materials, and in these clays the mineral composition is much more complex. It is true that the same principal mineral components are found here as in the white clays, but in addition there are other minerals, the amount of which we cannot yet estimate accurately, and whose effect is still largely unknown. Also the number of different components in such clays increases largely over those found in the white burning bodies, and, therefore, the difficulty of prophesying increases rapidly with the number of variables. At this time I may say that it is still practically impossible to accurately predict the behavior of a red burning clay by any mineral analysis that we can commercially afford to make. Thus it is seen that the rational analysis, though ahead of the ultimate analysis as a means of interpretation of clay compositions, is only valuable when applied to the minority of cases. The vast majority of clays do not fall within its scope.

Special Analysis.

Besides these two methods, there still remains the special examinations, which chemists are called upon to make in explaining the difficulties of the clay industry. These special analyses involve the search for and determination of any particular ingredient, which is known or suspected of causing trouble in clay manufacture. For instance, soluble salts which cause efflorescence, or sulphur which causes discolorations, or carbon which causes black cores, or the alumina-silica ratio, by which we predict the fusibility, or the iron by which we predict the color. Chemistry has given a good account of itself in this field. Whenever the clayworker knows exactly what he wants, the chemist is usually able to give it to him.

An increasing facility has been developing year by year along these varied and special lines of testing. Such methods are usually adopted to the explaining of troubles, which have occurred. They do not always enable us to tell in advance that the trouble will occur, but if it has occurred they let us see the reason, and once we know the reason we are far better able to avoid a repetition of the difficulty.

In summing up these three methods of chemical analysis it is fair to say that they are of enormous importance in some few branches of the clay industry, but of little and indirect use in the great majority of clay industries. As a means of research into the troubles which beset the clay industries they are invaluable. There is a tremendous difference between a method of test which predetermines the quality of the material, and another which shows the cause of the difficulties after it is past. Chemistry has done its best service in the clay industry in this latter field.

The average clayworker has the idea that a chemical analysis is a sort of cure-all for his difficulties, and that if he can have a chemist pass judgment on his clay, that he will be relieved of the worries and difficulties which have beset him. In asking for information, his almost invariable formula is, "What will you charge me to analyze my clay?" Not one in fifty thinks of telling the chemist for what purpose he wishes the analysis, nor is he able to interpret the meaning of the analysis if put into his hand. I think it is within the truth when I say that the average clayworker has no need of the chemical analysis. Its real use is as a means of investigation for the use of the chemist himself, and not for the clayworker at all.

I imagine I can hear some member lifting his voice to ask why, if this be true, we spend two or more years in our ceramic course in drilling chemistry into students who are to go out into the clay industries for their livelihood. If chemistry is not needed by the clayworker, why should we teach it? To enter into a discussion of this problem here would lead us too far: I may only say that we do not believe that any man is well equipped to make progress in the clay industry until he is a chemist. Until he has chemical training and until his mind is familiar with chemical conceptions, he has no real grasp of clayworking operations. And so, while our student may never have occasion to make an analysis, or handle a test tube, after leaving school, the chemical conceptions which he gains there interpret everything he sees thereafter.

Empiric Clay Testing.

Since chemistry as a tool for practical clay testing is thus seen to be of but little general value, the question next arises: What can we learn about a clay by any other means? If all clay testing were confined to a sort of post mortem, and only sufficed to show why the clayworker has gone broke after he has done so, I fear that ceramic chemists would find a rather lean livelihood before them. But, as a matter of fact, the things which we need to know about a clay are nearly all of them simple, practical things. They may be classified under three principal headings:

1. What are the working properties of the clay before burning? 2. How is the clay going to behave during the burning process? 3. What will its properties be after burning?

When we know the answers to these three questions, we are not likely to make any gigantic errors in selecting a site, or in designing a plant, or in running it after the erection. Though these questions touch at once on chemical or physical laws, they are notwithstanding much more easily solved by the simple and obvious way of trying the clay, and seeing what it will do, than by undertaking long-winded investigations in the laboratory. Practical clay testing, then, may fairly be considered to consist in the investigation of the material along these three main headings.

The Working Properties Before Burning.

What are these working properties? There are three of importance. First, the plasticity; second, the shrinkage, and third, the drying qualities. There are many other qualities which could be mentioned here: for instance, bonding power, tensile strength, specific gravity, porosity, size of grain, percentage of water for plasticity, etc., but, after all, these things are very much like the chemical analysis—they are chiefly valuable for post mortems. They may explain why a result has occurred, but it is much easier to find what the clay does by trying it, than by predicting what it will do on the strength of these tests.

Plasticity.

The plasticity mentioned as one of these three principal properties of the clay is the most remarkable of all. It is that quality which gives clay the advantage in many respects over all other minerals, viz.: the power to take shape and hold it. It is this quality which has made clays such a blessing to mankind from the earliest dawn of civilization to the present. Plasticity is that quality which enables a substance to flow rapidly under pressure into any form that may be needed, and yet enables it to retain this form without alteration when the pressure is removed. A plastic body is in a stage between that of the fluid and the solid. A fluid will take the form of any containing vessel, but it will not hold it when the vessel is changed in shape. A solid, on the other hand, cannot be changed in shape by pressure, except by disrupting it. The plastic substances obey the laws of the fluid in part, and of the solid in part.

But this property is as elusive as any with which we are called upon to deal. While we all know what it is, we still find it hard to define and impossible to measure. We can measure a few of its accessory properties, but these are slow and difficult to apply, and hard to interpret. The best way to judge of the plasticity of the clay is simply to mix it up with water and try it. The judgment of your finger tips is worth more than all the tests which a scientific laboratory can furnish.

In order to train one's senses so as to discriminate sharply between differences in plasticity, one should have a set of standard clays to judge by. These standard clays should be selected deliberately from clays with which one comes in contact in actual use. We should start with the toughest, waxiest, stickiest clay we can find for one extreme and go down by gradations into the weakest, softest, leanest earth that will hold together for the other. Between these extremes we should have not less than five nor more than ten gradations. Now anyone can tell by first working a little lump of the unknown clay in his fingers, and then one of the standard clays, which has the property of plasticity most highly developed, and thus the place of any clay in the scale can be determined with fair accuracy.

Besides this simple finger test, it is a good idea to force a clay out through a die under pressure, making it into a small bar or tube. Many clays which seem plastic fail in this test: That is, they crack and ruffle up and pull apart, showing working difficulties of a very troublesome nature, which the finger test alone would not lead us to expect. The importance, therefore, of forming some idea by the die test can readily be seen.

The beauty of these tests for plasticity is their quickness, cheapness and simplicity. Anyone can soon provide himself with the apparatus, and anyone can soon educate his fingers until they become skillful. The method is unscientific, it is true, because it does not give numerical results, but we must always bear in mind that we are dealing with something that is not definable in exact terms. A case will very seldom arise in which a clay that appears plastic by these tests gives trouble from lack of plasticity in actual working. It is much more likely that many clays would be condemned for lack of plasticity in the laboratory test, which, in practical work, would be all right, simply because their preparation would be much more thorough and efficient.

Shrinkage.

Shrinkage is the next property about which we must have knowledge, and here we are fortunate in finding a very simple thing to deal with. Anyone can measure the shrinkage of a clay. Simply mold it up with water to the required consistency, form a bar or long test piece, scratch marks at the required length upon it, and after drying quickly, calculate the percentage reduction in length between marks. This test becomes much easier, of course, if we have standard dies, or if we mark off our distances on the metric system. But these tools are not necessary to arriving at quick and accurate results; they are only conveniences.

The importance of the shrinkage test needs no amplification; everyone recognizes the bearing it has on the business of clay manufacture. Clayworkers sometimes do not appreciate, however, the difference and importance between shrinkage in burning and shrinkage in drying. Suppose, for instance, we desire to manufacture sewer pipe from a clay whose total shrinkage is 12 per cent, and upon investigation we find that 11 per cent of the shrinkage occurred in drying, and only 1 in burning. This would be a hard clay from which to get good results, because we would find that our pipe would be pulling out of round, warping, cracking, and that we could not make good welds, or junctions. The ware which got to the kiln safe, would come out safe, but the loss in manufacture up to the kiln would be terrific.

Suppose another case like a flint fire clay, which shrinks none in drying, but shrinks 12 per cent in burning. Such a clay would be absolutely ruled out of consideration for use in yellow ware, or encaustic tile, or face brick, notwithstanding the fact that its fine, clear, yellow color would make it exceptionally desirable for these industries. The reason is that it fire cracks until it is ready to fall to pieces in burning. It would even be impossible to use a little of it, adding non-plastics to offset this shrinkage, because the clay is already non-plastic itself. On the other hand, for refractory material such a clay is admirable, and there it finds its legitimate use.

These examples show that the measurement of shrinkage is not complete unless we know where and when the shrinkage occurs.

Drying.

Intimately connected with the shrinkage comes the drying problem. It is not identical, because some clays that shrink very greatly still dry safely, but, as a rule, it is safe to say that great shrinkage means tricky drying, and that small shrinkage means safe drying. The speed of the drying is a very important consideration, not only on account of the time and heat which is used, but on account of the fact that the majority of the efflorescence comes out when the drying is unduly long; also, some clays twist abominably in drying, while others with equal shrinkage do not.

There is at present no standard method of conducting a drying test. Everyone prefers to study out a method for himself in this matter; and, therefore, there is so far no way of accurate comparison between clayworkers in discussing this problem. What we need is a standard method of testing the drying qualities of clays, or a standard laboratory drier. It would have to be a machine in which the air volume, the humidity, the temperature, the velocity of the air currents, were known and under control, and in which the size of the clay test-piece, the time of its exposure, the rate of its exposure, and the total water contents were known. If all these things were under control it would be possible to characterize the drying of a clay in terms which would make its comparison with another clay possible. No such arrangement is in existence at the present time, so far as I know, but there seems to be no insurmountable difficulty in making one.

However, while we have not as yet reached the stage of standardized laboratory driers, we all of us can test the drying of a clay sufficiently well to determine whether it dries well or ill. We may copy slow drying conditions in a cold room, quick drying conditions in a warm room, or the severest drying conditions on top of a furnace or boiler, and we may judge from the behavior of the clay in these different places whether it permits of much latitude in its treatment or not.

With the knowledge derived from these three tests, i. e., that the clay is plastic enough for the purpose; that its shrinkage is not abnormal, and that it may be dried quickly without cracking or warping, or that it may be dried slowly without efflorescence, we know the essentials. No chemistry has been needed in determining these facts, and scarcely any tools; nothing but a small pair of scales, caliper, a rule, a little experience, and some good judgment. That is the outfit.

Testing of the Behavior on Burning.

Many clayworkers think that the principal difficulty of clay manufacture centers in the burning. That is not my experience. Some clays can be burned safely, which cannot be worked advantageously; further, many clays can be molded, dried and burned successfully, which are of no use when burnt. That is, their physical properties are not good, even when the best has been done for them by proper treatment. The burning problem, therefore, while it is a very serious one, is, after all, one which is under control of the operator to a large extent. But the ultimate qualities of the clay, which make it desirable or undesirable for use, are partly the result of the treatment of the clay, and partly the result of its natural constitution, and thus can never be wholly under control.

In the burning there are three points upon which we need information. First, the speed at which the clay may be heated up. Second, whether the clay oxidizes easily or not. Third, the range of temperature at which it vitrifies. These problems are different from those which have preceded. While the first is chiefly a physical factor, the second and third are strictly chemical in nature. That is, they rest upon purely chemical causes, and are merely time measurements of the rate at which a given chemical reaction progresses.

Rate of Heating.

Some clays as soon as the water is expelled may be heated up rapidly with perfect safety until the chemical changes of red heat begin. That is, they may be raised from 100 degrees to 600 degrees without giving the least trouble. Others will fly into a thousand pieces if the speed of heating up is too fast. Steam will burst any clay, if the heat is brought up so suddenly on wet wares that the water has no time to escape. But this snapping does not seem to depend upon the amount of water, for clays may be dried until bone dry and heated through and through, and yet snap and fly when the temperature begins to rise. No complicated process is required to determine whether a clay is safe in this respect or not. Only a simple, practical trial is needed. If the clay snaps when heated up quickly, look out for it. If it stands rapid temperature alterations safely, it is a point in its favor. It is fair to say that clays which give much trouble from snapping are not common, but when found they give great trouble.

Oxidation Behavior.

It was shown in the report of our Committee on Technical Investigation a year ago that practically all clays contain materials which must be either removed by burning or which must be altered in chemical condition so as to make them harmless. These substances were found to be carbon, sulphur and iron. The first two are removed by burning, at least, all of the carbon, and a very large proportion of the sulphur, may be burnt and carried out as the gases, carbonic acid and sulphuric acid. But the iron cannot be eliminated in this way, nor is it necessary. It only requires that the iron shall be put into the highest common stage of oxidation, in which the color imparted to a clay is red. Iron in this condition is not a detriment to the vitrification of the clay, but before it reaches this stage, it is a very real source of danger.

These three changes are all affected by one and the same agent, viz.: the oxygen of the air, which is absorbed as it flows through the kiln, and gradually does its work on the clay. The part of the burn in which this process goes on, we have, therefore, called the oxidation period.

It has not been recognized until recently that the oxidation period is an important stage in clay burning, but it has now been proved that such is the case, and that practically all clays must pass through this stage. The reason we have been so slow in noting this fact and giving it its proper weight is that in ordinary clays of the surface formations we do not find sufficient carbon or sulphur or ferrous iron present to make much trouble. They burn out or oxidize quietly and harmlessly at comparatively low temperatures, and we see nothing in the process or final product to indicate the fact that they have been there at all. But if we make a special experiment in order to find whether they are there, we have no difficulty in proving it. Only once have I seen a clay of this type so badly used as to develop defects from faulty oxidation.

But in recent years we have started working clays of another type, viz.: the fire clays and shales which lie deeply buried in the earth's crust, and which contain sulphur and carbon and ferrous iron in much greater quantities than the surface clays. In these clays the oxidation process thrusts itself upon our notice and we must reckon with it, whether we wish to or not. If it is not attended to properly, or rather if the clay burning is pushed forward without regard to this stage, the result will be ruined ware and heavy financial losses. Hundreds of firms are suffering from exactly this cause at present, and of the complaints filed by clayworkers more are attributable to this cause than to any other single one. In fact, almost as many as to all other causes put together.

It is not my purpose at this time to discuss minutely the oxidation period. I merely wish to call attention to the fact that some clays oxidize readily, and others do not, and that where clays offer obstacles to easy oxidation, this fact constitutes one of the most formidable handicaps which a clay may possess. In fact, if clayworkers in the past had chosen their clays advisedly, many clays now being worked at a loss or with a bare living, would never have been touched at all.

To judge of the qualities of any clay, then, it is imperatively necessary that we should carefully examine its prospective behavior on oxidation. Fortunately, the information is easily obtained. All that need be done is to draw trials from the kiln during the early stages of the burning and break them in two and observe how far the process has progressed. A dark discoloration in the center indicates the ingredients which cause the trouble, and when these discolorations disappear, and then only, is it safe to go ahead and raise the temperature for vitrification. The experiment is so simple that it is difficult to see how clayworkers have failed to learn for themselves this most necessary procedure, but it is only rarely that a clayworker thinks of doing so.

In judging of the quality of a clay in the testing process, one is much more likely to come into contact with these phenomena than in actual burning process, for the reason that clays are fired in testing at a much faster rate than in normal burning, and therefore the danger of imperfect oxidation is much greater. Everyone who handles test kilns is well aware of the constant difficulty experienced with faulty oxidation.

Continued in next issue.

DENVER COMPANY HAS BEEN FORMED TO EXPLOIT NEW INDUSTRY NEAR TOWN OF CALHAN.

Denver, Colo. men have organized a company to develop the deposits of fire clay in the Holcom hills, one and one-half miles south of Calhan in El Paso county. The company is capitalized at $1,000,000, and will be incorporated within a few days with the following officers: President, W. A. Bittman, of Marion, Ind.; Vice President, Theodore Marx, of Denver; Secretary, Ethelbert Ward, of Denver; Treasurer, A. J. Spengel, of Denver. It will be known as the Colorado Fire Clay Company.

The Holcom hills are said to be full of a deposit of clay that is better in quality than any other clay now found, except one in New Jersey. The deposit is easy of access and can be opened at small expense. It is planned to build a spur track from the Rock Island railroad and commence operations at once.

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The Cheney (Wash.) Brick, Tile & Mfg. Co. reports that local people are subscribing liberally to their stock. The company will start making brick in the spring.

DRYING OF SAND FOR SAND-LIME BRICK.

By P. L. Simpson, Chicago.*

Preliminary to a discussion of drying sand for the manufacture of sand-lime brick, a thought prominently presents itself to me—that the principal object that every manufacturer should have, and which is no doubt one of the main objects of this convention, is the possibility, and indeed, in many cases, the actual necessity, of making better brick.

It is practically a new industry, and, naturally, we are all more or less receptive to any new ideas that will make our product better.

There is no doubt that many plants have been erected in a slovenly, slip-shod and unmechanical manner, and the result is that in many instances the industry is in a somewhat chaotic condition. The causes leading to this condition are, of course, various.

P. L. SIMPSON, CHICAGO, U. S. A.

One cause is ignorance of the business; some contractors having actually attempted to install sand-lime brick plants without any previous knowledge of the business. Another cause is the desire to erect plants with an equipment of machinery totally inadequate for the work, not only from the point of view of economy of production, but also from a scientific standpoint.

As an enthusiast in sand-lime brick, I am, therefore, in view of these facts, an advocate of more scientific methods of sand-lime brickmaking.

The whole subject resolves itself into a question for the mechanical engineeer. The chemist has told of the chemical action or reaction involved in the phenomena that takes place in the hardening cylinder, and, no doubt, we will find his services quite invaluable to us in many ways, but after a particular sand has been tested with a particular form of lime, then it is for the mechanical engineer to get down to his drawing board and arrange machines of certain types that will accomplish the very best results obtainable at the smallest possible cost.

According to my ideas, the main pre-requisites for the making of a first-class sand-lime brick are:

First—Perfect hydration of the lime.

Second—Perfect mixing of the sand and lime.

Third—Perfect pressing of the mixture.

And along with the latter, careful handling of the brick after they are made. These primary essentials look towards the attainment of a first-class brick, and if all are accomplished no doubt a first-class brick will result. But how many manufacturers in these United States actually accomplish or realize these primary requirements? How many men in this convention believe that they have attained these results without the shadow of a doubt in their minds? I take it that few would stand up and state that they had absolutely reached that goal.

To these three primary requisites I would add a fourth, viz.: uniformity of product. How is this obtainable? My answer is, by a scientific and mechanical construction of a plant so that every minute's production will be alike; and to obtain this desired result it seems to me that a proper apparatus for drying the sand is necessary.

Sand-Lime Products meeting at Cincinnati, Ohio.

At the inception of the sand-lime brick industry into this country, dryers for drying the sand were lost sight of. It was something that it was felt might be necessary, but was put off until the time would come in the course of events when it became absolutely necessary. Even to-day quite a number of plants are running without using a dryer, and some contractors are erecting plants where a dryer is not even considered in the equipment.

Bear in mind our works can no longer be termed "brickyard," but factories, and we have the advantage over old-fashioned brickmaking of being able to make brick regardless of climatic conditions. But our sand is outside of our factories—subject to all the various vicissitudes of the weather. The sand is, therefore, found in different conditions of moisture—sometimes very wet, sometimes the opposite, but rarely the latter. It is, therefore, reasonable to suppose that in order to establish uniformity in a plant, the sand must be reduced to a definite and uniform condition. Surely, no one will argue proper methods are followed when sand is brought in from the field in various conditions of wetness and expect that the mixture will be uniform, or that the condition of the mixture as it enters the press will be uniform, and if it is not as near uniform as possible, the pressing of the bricks are invariably imperfect. Those concerns who adhere to this manner of handling their sand will doubtless soon realize (as many are doing to-day), the necessity of drying the sand so that a uniform product may result. I do not think, therefore, that any successful argument can be raised against the necessity of using a dryer for the successful manufacture of sand-lime brick.

The next point is the kind of dryer to use. The market to-day is full of various apparatus for drying different substances, one of the most common being the rotary dryer.

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*Read at the National Association of Manufacturers of Sand-Lime products meeting at Cincinnati.

The disadvantage of this method is the amount of power and fuel required to run them, for unless they are a good size the capacity will be inadequate. A rotary dryer is all the more objectionable if the sand should come in contact with the products of combustion, so that from the point of view of economy of power and general efficiency there is no doubt that for sand a pipe dryer is to be preferred.

It would, of course, be out of place for me to take advantage of this opportunity to exploit the advantages of any one form of pipes, but I will only say that should anyone believe that a mere aggregation of steam pipes, one above the other, will dry sand, he is very much mistaken. There we have a pipe dryer, say 5 or 6 ft. wide, 18 or 20 ft. long, with say 2 ft. of wet sand piled up above the tiers of pipes. Now, how is the moisture to get out of that sand? Evidently, the bottom of the pile must be the hottest, and, therefore, the moisture must ascend through the mass of wet sand. It is not at all apt to do this and, consequently, some other means is necessary to get rid of the moisture.

In the most approved of pipe dryers—and which was the result of a long experience in drying sand for glass making purposes—it was found that by introducing pipes of 4 or 5 ins. in diameter, slotted in the lower side of same, across the longitudinal drying pipes, that then the moisture would entrain into these transverse slots and thereby the moisture would leave the sand as fast as it was formed. This result is all the more readily attained by the introduction of an air duct running lengthwise of the dryer, connected with these transverse or moisture pipes, and this air duct being connected with a fan or high chimney to induce a sufficient draft. This is an invention patented by an Illinois gentleman—John Findlay—some years ago.

Another advantage of a pipe dryer is that it need not be located on the ground floor of the factory as a rotary dryer must be, but may be installed upstairs in close proximity to the lime bin, and thereby one man can attend to both.

I have heard it argued that a proper mixture cannot be attained when sand is as dry as it is possible to make it. I was under that idea myself at one time, but experience has dispelled this illusion. There is glutinous condition enough to lime to enable it to stick to the particles of sand, no matter how dry.

In conclusion, I would urge all manufacturers of sand-lime brick to be content with nothing but the best. Do not be afraid to discard the old in favor of the new when you are convinced that by so doing you will be able to better your product, cheapen your production and advance the art of sand-lime brickmaking.

At the opening of the discussion, Mr. Duerr was unable to see where the economy came in, because when live steam was used you could only get 60 per cent efficiency. This suggested that exhaust steam might be used, and a number of those present gave their experience in that line, many of them having tried it.

Mr. Straight, who has had a great deal of experience in lumber dryers, said that he always used the exhaust steam, and thereby gained large economy. He said that there were two things that you must do with a dryer. The first one was to remove the moisture from the material, and the second one was that as soon as it was out of the material it must be removed from the room, and quoted Mr. Simpson's statement—an aggregation of pipes was not all that was necessary. He also said he had been using live steam on his sand dryer, but he would soon have his arrangements shaped around so that he would do his drying with exhaust steam. He said the cost of drying depended upon the cost of heat units and that by using exhaust steam you saved just so much by using a certain amount of heat which you otherwise allowed to go to waste. He said with a header of 5½ ft. 2-in. pipe, 1¼ in. space, and good ventilation, you could throw wet sand on and dry very satisfactorily. Of course, this gave a limit to the quantity which can be handled. With a 40-h. p. engine the exhaust steam you get will dry 7 to 8 cu. yds. in 10 hours. He said it was probable that with the use of exhaust steam more steam would be required than the power used at the sand brick plant will furnish.

Someone suggested that Mr. Hendricks had an exhaust steam dryer at Sibley, and Mr. Hendricks said that it was insufficient and that it was possible that with more pipe they could get larger drying capacity, but that he did not believe their power would furnish sufficient exhaust steam to do the work.

Mr. King stated that he had fourteen years' experience with the use of dryers on other material, and said that he had put in steam dryers at an expenditure of $7,000 one time, but that he pulled them out and was now using a rotary dryer 22 ins. in diameter by 22 ft. long, with a fall of 6 ins. from end to end. He had this bricked in and arched over. The rate of feed through this machinery is regulated by a change of slant. He is now getting through from 40 to 50 yds. per day with a fuel cost of 700 lbs. of coal for 10 hours. The sand goes in here the second day after it comes from the river, so that it is pretty wet yet.

When asked, Mr. King was unable to state what percentage of moisture it had. Mr. King used no baffle plates, but just depended upon the lap and rivets to agitate and distribute the sand. When asked just how the heat traveled through the dryer, Mr. King said that it was just a direct draft, using a furnace with a bridge wall.

Mr. Dean was using a sand dryer and direct heat rotary with pockets. The dryer is 30 ft. long and the draft is aided by use of a fan. There is only 4-in. fall in the 30 ft. and the dryer is run at 300 to 400 r. p. m. Capacity is 40 to 50 yds. of bank sand, using from 600 to 800 lbs. of coal, but after a rain he cannot get near that capacity. He said, "We run our dryer at a pretty high temperature and find that if we get it too hot it darkens our sand. We bring our sand in by team and a scraper."

Mr. Squier had tried several rotaries at Buffalo, Scranton and elsewhere, but they only have one now in use, and expect to throw that out and introduce steam before long. However, if you have clay in your sand he does not recommend steam, but otherwise considers it the best. He said that he did not care to say anything about this type of dryer at this time, because the manager of the Scranton plant was interested in their type of dryer, but that if anyone wished they could correspond with Mr. Merriman. In connection with the dryer proposition, President Squier said that they greatly preferred uncracked sand, especially for the plaster business; that is, sand dried at a low heat. Mr. Duerr then wished to know if he could get any data as to the amount of exhaust needed to dry sand. He could not give definite data, but stated that they dried from 80 to 90 yds. of sand with their exhaust steam, but not in 10 hours. They would take advantage of having the system full of exhaust steam when they shut down and hold it, and should use live steam right away in the morning in order to get the dryer heated up as quickly as possible.

Mr. Smith was getting good results from a dryer 15 ft. long and 9 ft. high, but was using live steam because the exhaust was not sufficient.

Mr. Carmichael suggested that it would be advisable to use a little live steam at night, and also asked whether the steam was not utilized in discharging their kettles or hardening cylinders.

WHAT ARE THE RELATIVE MERITS OF CEMENT AND ASPHALT FILLERS FOR BRICK PAVEMENTS.*

By H. C. Innes, C. E., Cincinnati.

All construction work in a city or elsewhere, coming under the direction or supervision of city officials and engineers, must have a starting point. In fact, all matters have a beginning and a development, and the progression originates with the desire to improve and perfect, culminating, through a series of experiments, in the condition sought. In the work, we usually start with somewhat crude ideas, observing such defects which can be improved to eliminate serious objections, and give in turn the improvement needed to secure results.

In municipal construction, one very important division is that of the street department. Seemingly every individual has some method of making the very best street on earth. Every street constructed or reconstructed of any of the accepted paving materials has a score of interested property owner inspectors. No doubt many of you have stood on the curb and listened to suggestions from the observers which carried some food for thought and reflection as to possible better methods of construction.

If we can build and please those who make use of our streets and at same time those who may be affected by the payment for the improvement, then we have an endorsement from a very effectual source. Betterments or improved methods are usually attended by an increase in cost over old or original practice, but I may say not proportionately as to benefits derived. In an effort to secure advancement in the method of bettering the surfaces of our brick or block streets, it is the object of this paper to consider a stage in the construction which may not have received the attention it should. I refer to the joints between each brick laid. This is practically the last stage in the construction of the roadway, except the cleaning up, and should be given the same consideration as any other part, lest by shifting the responsibility from one part to another, principally to the brick, we may not secure the successful results we had hoped for. As an illustration of this I may cite that in the construction of concrete we ofttimes pay more attention to the brand of portland or natural cement we use than to the other ingredients. Sometimes failures occur, and almost invariably the cement must shoulder the blame. The stone and sand being the factors of the largest proportion, should receive the same ratio of attention. If not, it is rather hard on the cement.

We are all familiar with the two-course brick roadways and sand-filled joints. Then the next step is placing the brick on a sand cushion and concrete foundation. Seemingly the best results were secured by the firm concrete base, hence to-day this is the accepted construction standard. Often brick roadways are laid upon gravel or crushed stone bases, or upon an old macadam road trimmed down to the proper contour, with favorable results. To secure good results much depends upon the method of construction, the specifications as drawn by the city engineer, the workmanship and a high standard of quality of the material specified and used.

Each step should have and be given the best of attention. The grading and rolling the subgrade, the material and method of mixing, laying and tamping in place of the concrete, its protection during the setting, care of forming the correct sand cushion contour, the selection of well-made brick and laying them to true lines and grade, the inspecting, the tamping or rolling, and finally the filling of the spaces between bricks with some suitable material best adapted for the purpose, should have earnest consideration. Each step enumerated is as important as any other point, and should have the best thought given it to secure upon completion the results sought, namely, the best pavement for all purposes obtainable from the close attention to material and workmanship. This done, the weak points, should there be any, due not to inattention or carelessness, would be greatly strengthened by others supporting such places, thus assisting to secure the results sought.

Having performed the several stages of the work, securing good concrete of the required thickness, and laid the brick on the sand cushion, the surface rolled to an even contour, we are now to the last stage of filling the joints and completing the contract.

Now, what shall the filler be? Which will secure us favorable results and which will give the best results when worked out in a series of ways? Shall we use sand, cement grout, tar or pitch, sand and tar, or an asphalt filler? Let us make a selection for results.

Sand is no doubt the cheapest, both in cost of the material and in the placing it in the joints. When this is said, perhaps all has been said that is favorable. It affords no prevention against filth lodging in the interstices, is entirely unsanitary, it readily washes out and into sewers, and, permitting street dirt to work into the joints, it increases the cost of cleaning the streets and sewers, so why pay out something for an undesirable material and again pay to remove it from the sewers? It affords no protection to the edges of the brick; it permits the edges to be chipped by the shoes of horses, greatly to the disadvantage of travel and ease of traction. It creates a pervious instead of an impervious surface, the brick being practically so, hence opportunities for freeze and thaw, and to injure the base as well as the surface. Sand filling is not a factor which can be relied upon in case of an emergency. It has only the first cost to commend it, with a very great inequality sign opposite. Sand should not be used in this connection. It is excellent for other purposes, such as that of making a cushion for the brick to rest upon and in the making of the concrete base. When it has been used suitably for these purposes, I think we have asked all we should of one material in the general construction.

An improvement over the sand filler seemingly is the cement grout, often used for this purpose. It is composed of portland cement and sand in various proportions mixed with considerable water and spread over the brick surface and broomed into the interstices. Its cost is reasonable, depending upon the prices paid for cement and sand. The item of labor for mixing is low. There as a tendency, where so much water is used, for the cement and sand to separate, thus not getting a uniform consistency throughout an entire batch. This class of filler is more expensive than sand. After brooming into the joints time should be given to permit the mass to set before travel has been turned into the street. When set it adheres to the brick and becomes a solid, rigid street covering. It prevents any seepage to the under soil or concrete base; in this respect it gives favorable sanitary conditions. There is a possibility of the sand cushion beneath the brick taking up some of the cream of the grout when it is poured or slushed on the pavement. If such is the case our filler is weakened, the cushion in part being converted from sand into a weak mortar, which removes its effectiveness of a cushion. Should it become necessary to enter the roadway for some connection, it is difficult to replace the old brick, due to the mortar adhering, necessitating chipping, consuming time and possibly some brick. Cement grout filler, when set, is hard, firmly uniting the brick into a solid surface, prevents the chipping of the edges and the street accumulation from entering the joints. Being hard, it is also an excellent conductor of sound, and adds to the foremost objection of the paving material itself, namely, it is noisy. Were the filler of an elastic nature, this quality would greatly reduce the objection of sound vibrations and tend to give better results by minimizing the one serious objection ofttimes raised. As with the sand filler mentioned, we find good use can be made of the cement in the concrete foundation to insure firmness for the wearing surface. When it has performed this requirement successfully it surely gives much to the success of the pavement, in giving an unyielding archway of concrete, protecting against settlement of the surface.

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*Read at the Birmingham meeiing of N. B. M. A., February, 1905.

An ideal filler should possess qualities truly essential for the best results. Not alone entirely for itself, but to readily advance benefits to other material used in connection therewith. It should be the outgrowth of experience extending over periods of observations, to afford betterments, obliterating objections, and produce at the present time the best material for the purpose intended. It is incumbent upon future experience to possibly discover something better. I would place as the first requisite for a filler in brick or block streets, that it should be sanitary and noiseless, to give comfort. In our estimate of dollars and cents we cannot, or do not, place a monetary value upon the item of comfort. We can readily estimate the cost of a street having the prices of material and labor given, but doubtless very seldom does the item of comfort enter into the equation.

Secondly, the filler should be, I believe, elastic, pliable, and not rigid, this being essential to permit of expansion and contraction, to avoid, if possible, the buckling of surfaces or the giving of pervious joints. In that, the surface being jointed, it is intended to promptly adjust itself to unlooked-for conditions—to guard against any and all objectionable conditions unforeseen.

Third, it may be well to consider the item of maintenance and the re-use of material taken from the street for cuts, occasioned by conduits or connections. Cement once set is valueless for use again, and must be wasted; asphaltum can be again used in the same manner by reheating. Brick are easily cleaned when the latter material is used, but somewhat difficult in the case of grout.

Fourth, the weakest part of a brick or block is its edge, and unless protected and supported soon wears, rounded by the action of the wheels and horseshoes. Grout, if it can be placed in the joint so as to completely fill it, meets these requirements when set, but requiring, as it does, some time to secure the initial and final set, and, considering the contour of the street, it has a tendency to flow toward the gutter, the lowest place, leaving some of the joints only partially filled. The asphalt filler, having greater density and viscosity, tends to fill the joints somewhat better and if not completely full, any additional material added readily unites with that previously poured. It also protects the edges of the brick completely, judging from surfaces examined where this class of material has been used.

Fifth, I would place the first cost and final cost. If the first cost is low there must be some reason; if high, considering, equally another reason. In some instances low costs and results may make an equation. Again it may be low first cost plus high final cost, equal results somewhat unsatisfactory. Likewise higher first costs which give an article entirely satisfactory plus low maintenance costs produce results, giving increased use and durability, coupled with advantages through satisfaction and contentment, also reduction in final costs.

Concluding, then, that an asphaltum filler is the best and should be the material used in the filling of joints in brick or block pavements, it should possess the qualifications which will give the results sought. The filler should analyze about 100.0 pure bitumen for the best results. It should be unaffected by water or street liquids, should be easily handled and placed in the joints at as low cost as possible, should be so tempered as to meet weather conditions or sudden changes. It must not be too soft in summer or brittle in winter. Disintegration must not take place. It should have been tested in street paving as a filler for some years to prove its worth before adopting it. A filler meeting such requirements would give good results and could be relied upon for service. In this respect, certificates from city engineers having in use an asphaltum filler in their respective cities could be accepted as proof of the advantages of such a filler.

The writer has used asphaltum cement filler in connection with brick, scoria block, Medina block, granite block, Hayden block, etc., with results highly satisfactory. Resulting conditions observed warrant the statement, if for no other reason, than that the noise was greatly reduced and where settlements occurred showed the joints waterproof and closed. Cement grout was also used in many instances, but the best results seemingly were obtained from the asphalt filler.

Attention is called to the filler produced from asphalt, which is rapidly displacing other materials formerly considered in this particular. Many claims of merit presented have been verified by practical tests. Observations of a brick street carefully laid upon a good concrete foundation of sufficient thickness, using the proper sand cushion, a well-made vitrified brick and the joints filled flush with an asphaltum filler, produce results which are very gratifying. The object of the filler is to prevent seepage from the surface to the foundation, closing perfectly the interstices against lodgment of germs, the breeders of disease, to afford and give protection to the brick or block against chipping caused by the horses' shoes, to prevent that grinding due to heavily loaded wagons in passing over the surface, theoretically spanning the joint, yet practically tending to grind for an instant the edges unless protected. A very important advantage of the asphalt filler over the cement grout is the great reduction of the noise produced. Being elastic in a sense, a deadener of sound, street noise produced from the passing of vehicles is greatly reduced and in this, the first objection raised to brick as a paving material, is in a measure silenced. It has the decided advantage of shaping itself as conditions may make necessary; in case of a settling of the foundation, as ofttimes occurs, the surface also must settle with it, when it does the asphalt filler assumes readily its new condition, yet filling the joints completely and preventing filth from lodgment. The rumbling sound often heard coming from a brick street may be produced by the foundation and sand cushion separating from the brick surface (which is an arch firmly keyed when cement grout filler is used) ; this could not result if the joint was filled with a flexible asphalt filler because when the separation of the foundation and cushion took place, the surface by its own weight and the passage of vehicles would tend to place the brick surface again directly upon the foundation, avoiding the space otherwise produced. The theory of concrete contracting during the process of setting and after the surface has been laid, producing the rumbling sound given from a brick street where the joints are filled with cement grout is well founded. Yet where such joints are filled with an asphalt filler, plastic in nature, this would not result for the reason given that the surface would readily adjust itself to the foundation which should support it.

We have read of brick streets buckling and bulging under the hot summer's sun until the limit was reached, then breaking with an explosive report. Such surfaces were filled with grout. Brick and cement mortar will expand with heat, the force being very powerful, and the elongation considerable, especially when the heat is continued for some time. Being rigid, the surface expands until the limit has been reached, at which time the weakest material must give. This usually is the cement filler due largely to its thinness, the result being a shattered, previous joint. Were the asphalt filler used, the expansion would continue just the same, but the bulging or buckling would not, because being flexible and plastic under that same temperature it would meet the conditions imposed upon it, thus readily adjusting itself to the expansive force of the brick, be crowded up and that part raised above the surface of the brick flattened by the passing wheels over the edges of the brick. In the case of contraction during cold weather, there would be a tendency for the adhesion of the grout to the brick to be broken, which would produce undesirable results. This would not occur with the asphalt filler, especially when the filler retains its flexibility to a low degree of temperature. As before, it would shape itself to meet the new condition imposed, the result being a closed joint, impervious, and a poor conductor of sound.

For some years an asphaltum filler has been in use in connection with brick and block street paving material. Good reports come from those cities using it and city engineers speak well of its qualities. This filler is prepared in Chicago by the American Asphaltum & Rubber Co. of that city, the component parts being approximately 68 per cent petroleum and 31 per cent asphaltene or 99 per cent plus, pure bitumen. The melting point is about 210° F.; the filler is used at a high temperature in actual work, perhaps 400° F.; a gallon weighs approximately 7.5 to 8 lb. or 250 gallons to the ton of 2,000 lb. It has been tested by actual service for some years, both as a filler and for expansion joints, and reported on very favorably. In constructing a brick street using this filler, portable asphalt or pitch wagons or kettles are used to heat the material. In order to expedite the melting and pouring at least two such kettles should be used to avoid delay in waiting for material to melt. It should not be used until it is thoroughly melted and flows readily. In pouring and filling the joints, conical pouring pots are used, a wire passing through the apex operated by the workman so as to permit the filler to run into the joints or stop the flow as may be desired. The use of such pourers in the hand of a careful man will save wasting material and at the same time better and more completely fill the joint. Approximately one gallon is required to one square yard of paving brick, paving block somewhat larger than the brick, taking less.

An advantage to the general public in the use of a filler of this class is that the continued inconvenience of having a street blocked for three or four days to permit the filler to set or harden is reduced. Grout requires this time. As soon as the joints are filled with asphaltum a light sweeping of sand can be placed on the surface and the street opened for travel. When once in the joints, there it remains until disturbed for some underground work. Upon completion we have a surface composed of hard vitrified paving brick surrounded on all sides by a thin section of elastic, non-conductor of sound, waterproof material. The brick being thus separated one from the other, sound is not communicated to the adjoining brick and the street noises are certainly reduced.

In summing up the subject it would be the object, mainly, to create a desire for improvement in the construction of streets. Brick being one of the paving materials largely used, which has advantages and disadvantages, it should be the aim to reduce the objections and increase the advantages all that is possible. In so doing we assist a large community to the enjoyment of better thoroughfares. The subject of a proper filler for brick or block streets is one which has had some consideration, but possibly not as much as it is really entitled to receive at the hands of the producers of brick and city authorities. Examination of different fillers now in use, in various cities, duly reported, tabulated and fully considered, should be productive of results beneficial to all interested in the advancement of better methods of construction. Let us ascertain if comfort and benefits are not factors worth considering in making up an estimate for the cost per square yard of paving.

THE AMERICAN HYDRATOR FOR HYDRATING LIME.

Sand-lime brick manufacturers have been troubled more or less by the uncertain and often unsatisfactory results obtained from the hydrated lime used in their product. If the lime is not thoroughly hydrated or contains any unslaked particles, these particles slowly slake under the heat and steam, which permeate the entire brick in the hardening cylinder and cause them to swell, thus rupturing the complete bond at numerous points in the brick and weakening the brick to that extent. Indeed if the hydrate contains free lime to any extent, the brick will come out of the cylinder larger than they went in and be materially injured.

The presence of free lime is readily detected, by moistening the hydrate with cold water and then noting, by means of a registering thermometer, if there is any rise in the temperature during the next 24 hours.

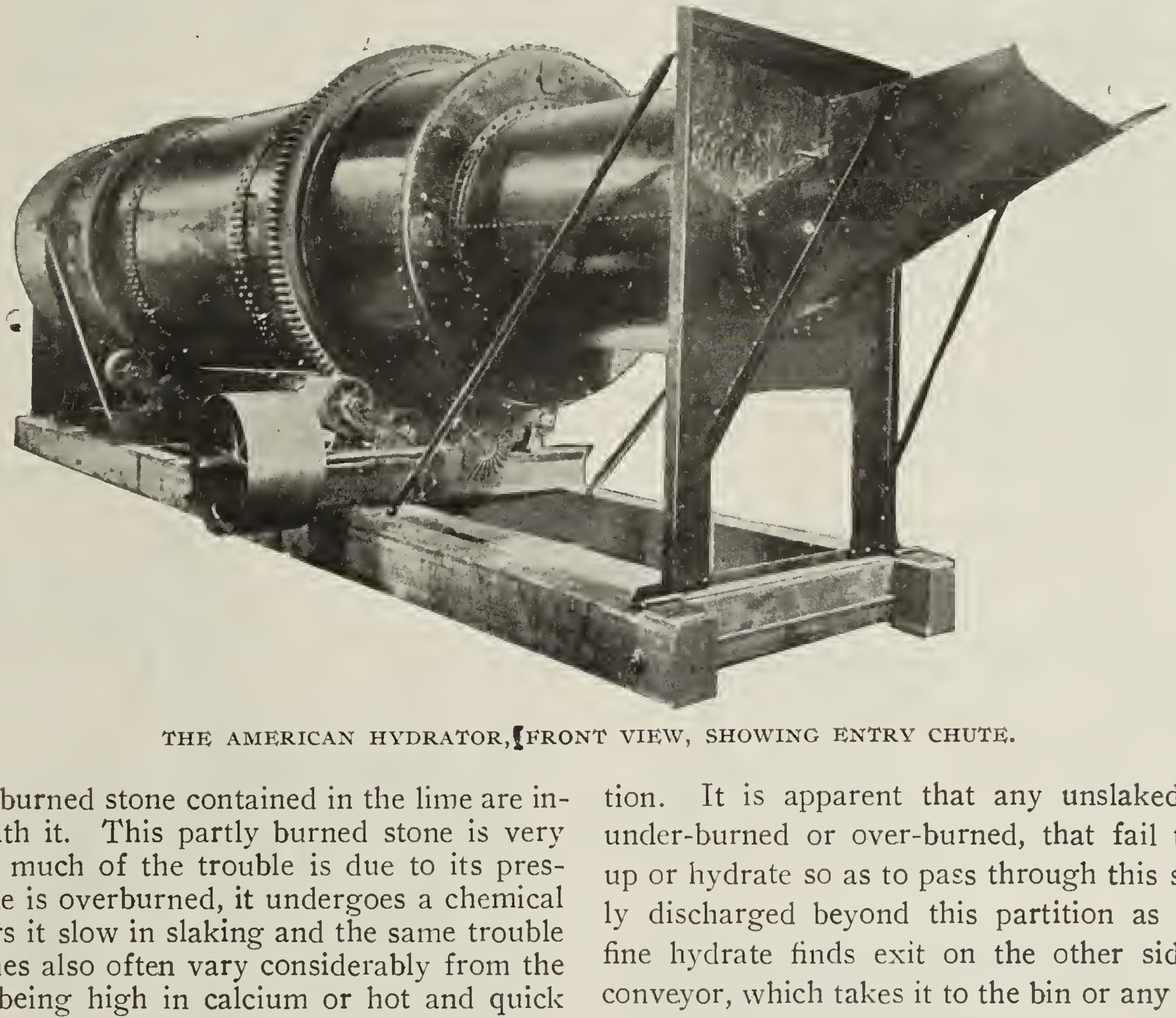
Most of the hydrated lime now on the market is made by one of what is known as the "quick processes," by which all impurities or partly burned stone contained in the lime are inseparably ground with it. This partly burned stone is very slow in slaking and much of the trouble is due to its presence. Or if the stone is overburned, it undergoes a chemical change which renders it slow in slaking and the same trouble is experienced. Limes also often vary considerably from the same quarry, some being high in calcium or hot and quick slaking, while others are dolomitic and contain considerable magnesium and are correspondingly cold and slow slaking. If a lime contains both these qualities, it may be that the former becomes hydrated whereas the latter does not, or only partially so, and thus poor results will follow.

There are some manufacturers who slake their own lime, by one of the many more or less crude and expensive methods, requiring considerable handling and giving uncertain and often unsatisfactory results.

These difficulties have at last been overcome, by a recent invention of James Reaney, Jr., of Baltimore, Md., who has obtained patents on a machine and process, for converting quick-lime into powdered hydrated lime, which promises to revolutionize this especial line.

Briefly described, the machine consists of a revolving cylinder, somewhat like a rotary kiln, containing a screen or screens, which are set at an incline, so that as it revolves, the material within slowly advances through it. The lump quicklime is dumped into the machine by the wheelbarrow load and as it passes down through the entry chute, its weight presses open a swinging door, which is connected with a flush tank above. This tank contains the desired quantity of water to hydrate the wheelbarrow of lime, which always holds the same weight. The flow of water into the tank is shut off by the ordinary ball float, whenever the desired quantity is reached. This water is sprayed upon the lime as soon as it enters the machine and is being tumbled therein. All that is necessary therefore is to weigh each charge of lime, as the water is automatically measured and sprayed upon the lime more evenly and thoroughly than it would be possible to do by hand, and the machine completely mixes them. The commingled mixture then passes onto a tapering screen, where the slaking begins, and the fine particles, as they hydrate, pass through onto the outer cylinder, from which they are discharged as hydrated lime, free from all impurities.

The tapered screen extends beyond the encasing cylinder at the lower end of the machine and discharges beyond a partition. It is apparent that any unslaked particles, whether under-burned or over-burned, that fail to chemically break up or hydrate so as to pass through this screen, are separately discharged beyond this partition as waste, whereas the fine hydrate finds exit on the other side, and falls into a conveyor, which takes it to the bin or any desired point, ready for immediate use.



THE AMERICAN HYDRATOR, FRONT VIEW, SHOWING ENTRY CHUTE.

Both ends of the machine are closed, and all air is excluded during the process by means of steam, which is conveyed into the interior of the machine by means of a perforated pipe. The steam also hastens the conversion and renders it complete.

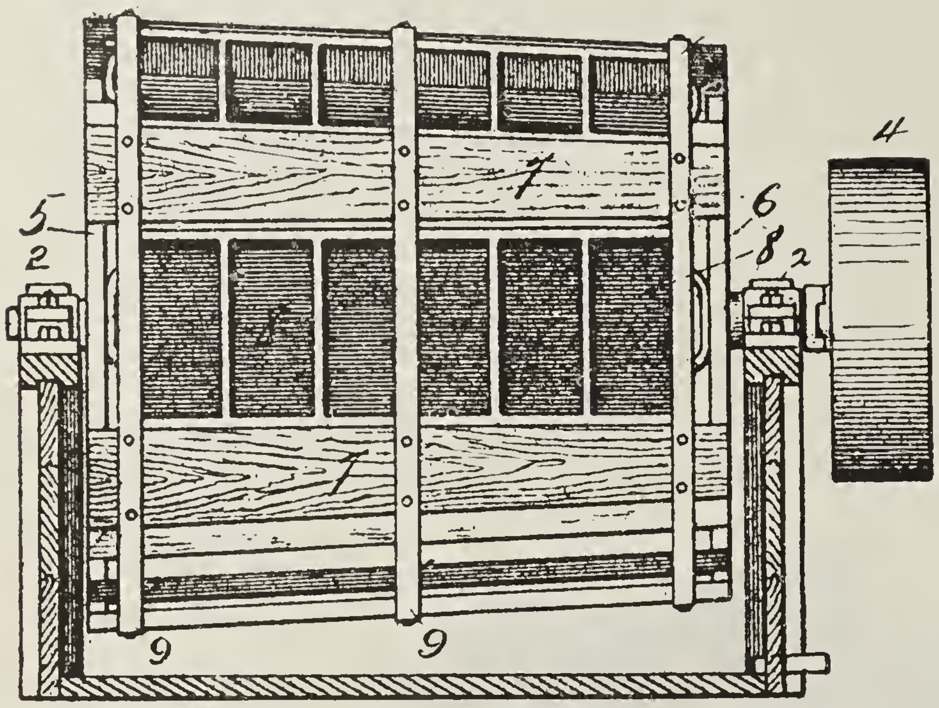
The process is entirely automatic, the only thing being the weighing of the lime, as the machine does the rest. The cost of conversion by this process is said to be more than offset by the gain in weight of the hydrate.

These machines are being manufactured in several sizes, with capacities of from one to ten tons per hour, by The American Hydrating Co., with offices at Baltimore, Md., and Delaware, Ohio.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

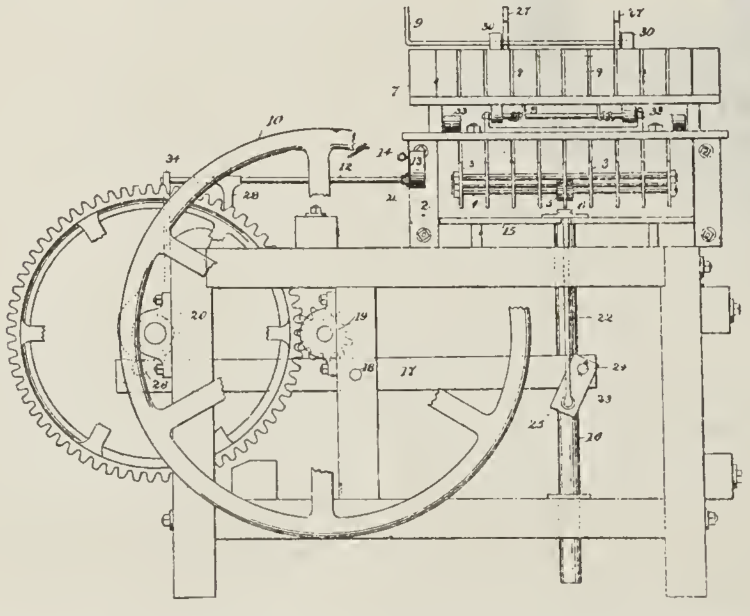
These new inventions are those that are especially of interest to any one engaged in the line of building materials and their manufacture, or machinery to make them.

777,620. Brick-Mold-Washing Machine. James E. Fox, Toledo, Ohio, assignor to Collingwood Brick Company, Toledo, Ohio. Filed Sept. 24, 1903. Serial No. 174,429. (No model.)



Claim.—A machine of the described class comprising a tank, an open frame journaled upon the tank, said frame tapering toward one end, receptacles in the frame for molds, said receptacles having openings at the larger end of the frame for the introduction of the molds, and means for revolving said frame.

777,155. Machine for Pressing Concrete Bricks. Henry H. Spears, Louisville, Ky. Filed Aug. 20, 1904. Serial No. 221,453. (No model.)



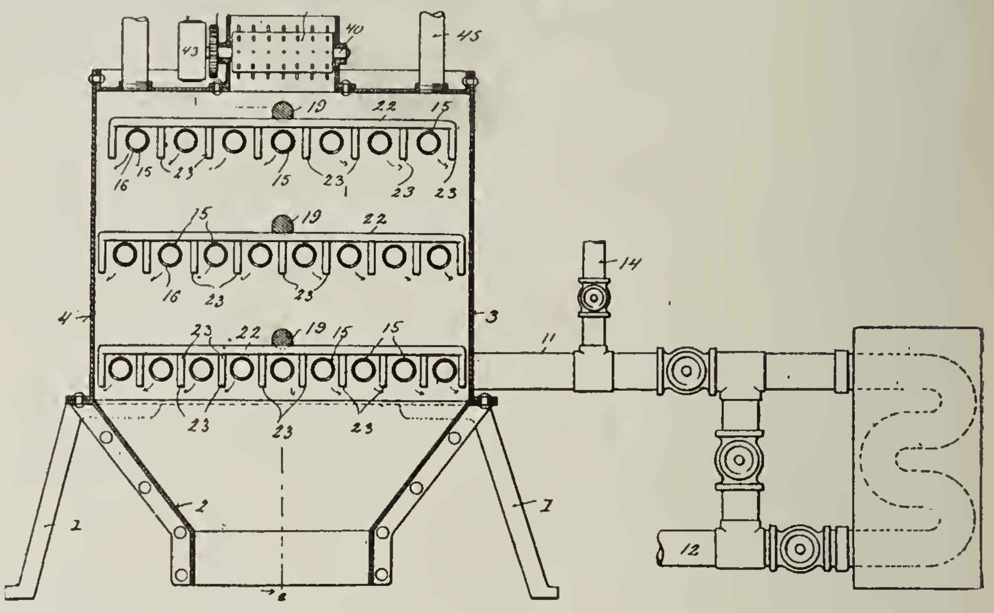
Claim.—1. In a machine for making concrete bricks, the combination of a bottomless mold of the size to hold a given number of bricks, with a plunger movable upward having a cap fitting into the mold, slides one less in number than the bricks which the mold will hold, running in slots in the front wall of the mold, and a lid which can be clamped down upon the mold, substantially as shown in the drawings and specifications.

777,995. Fire-Brick Composition. John Anderson, Monaca, Pa. Filed Jan. 9, 1904. Serial No. 188,385.

Claim.—The composition for fireproofing, consisting of silica-sand, 90 per cent; asbestos, 5 per cent; fire-clay, 5 per cent, and a sufficient quantity of salt water.

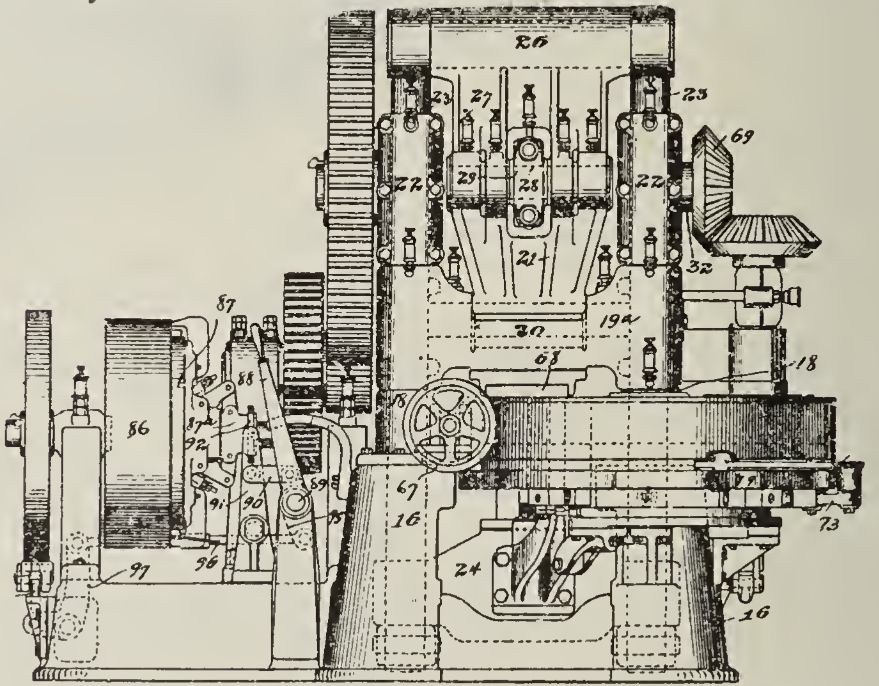
777,225. Drier. John Scott, Milwaukee, Wis., assignor of one-half to Edward P. Mueller, Milwaukee, Wis. Filed April 23, 1904. Serial No. 204,563. (No model.)

Claim.—1. In a drier, the combination with a drying-chamber, having a suitable inlet and discharge, and provided with rows of perforated stationary hot-air pipes, horizontally arranged in vertical series; of series of reciprocating rakes, whose teeth depend between the said hot-air pipes.



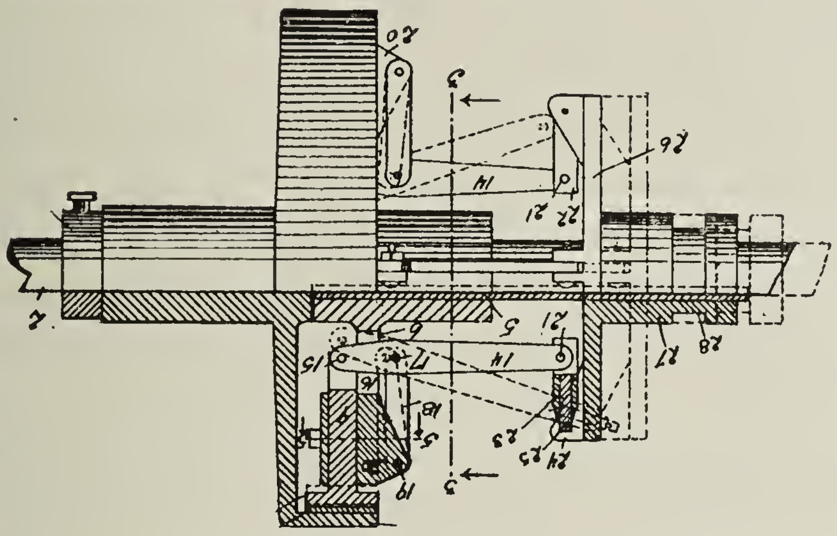
778,483. Brick-Machine. Harry J. Flood, Chicago, Ill. Filed May 20, 1904. Serial No. 208,858.

Claim.—In a machine of the character described, the combination with a supporting-frame, of a mold-table rotatably mounted therein, said mold-table having a series of radially-disposed mold-boxes, a plunger carried by each of said boxes, means for actuating two of said plungers simultaneously, one for compressing the material and the other for ejecting the compressed material, a circular track underlying said mold-boxes, one section of said track being rigid and supporting the plungers in their highest position and the other section being vertically adjustable and supporting the plungers in the charging positions of the mold-boxes, substantially as described.



In a machine of the character described, the combination with a supporting-frame, of a mold-disk rotatably mounted therein, said mold-disk having a series of radially-disposed mold-boxes, a plunger carried by each of said boxes, a circular track underlying said mold-boxes, one section of said track being elevated and supporting the plungers in their highest position and the other section being depressed and supporting the plungers in their lowest position, a vertically-reciprocable plunger-actuating device disposed between contiguous ends of said track-sections and carrying an inclined track which terminates at its lower end in a support for the plunger in its compressing operation, and at its upper end in a support for the plunger in its ejecting operation, means for simultaneously rotating the mold-disk and lowering said plunger-actuating device at such relative rates of speed as serve to maintain the plunger vertically stationary at the completion of its compressing movement as it travels over said inclined track-section, and a spring-actuated catch disposed adjacent to the receiving end of the elevated track-section arranged to engage and support the plunger when raised to the limit of its ejecting movement, substantially as described.

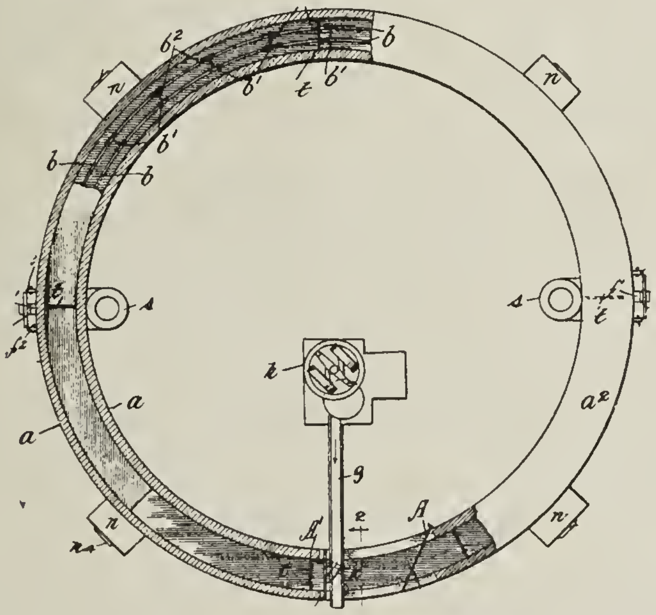
777,158. Frictional Clutch-Pulley. George S. Tiffany, Tecumseh, and Edwin C. Sword, Adrian, Mich. Filed Feb. 16, 1903. Renewed April 8, 1904. Serial No. 202,236. (No model.)



Claim.—1. In a friction clutch-pulley, the combination of a pulley loose upon the axle, a disk fixed on the axle, friction-shoes slidably mounted on said disk, and adapted to engage a flange of the pulley, horizontal levers pivoted to said friction-shoes, radial links pivoted to said disk and to said levers forming a fulcrum therefor movable in the plane of the axles of said disk as said levers operate, and a shifter mounted upon the axle and connected with said levers for actuating them.

777,767. Continuous Dryer for Briquets. Colby M. Avery, Chicago, Ill., assignor to Chisholm, Boyd & White Company, Chicago, Ill., a corporation of Illinois. Filed June 3, 1903. Serial No. 159,922.

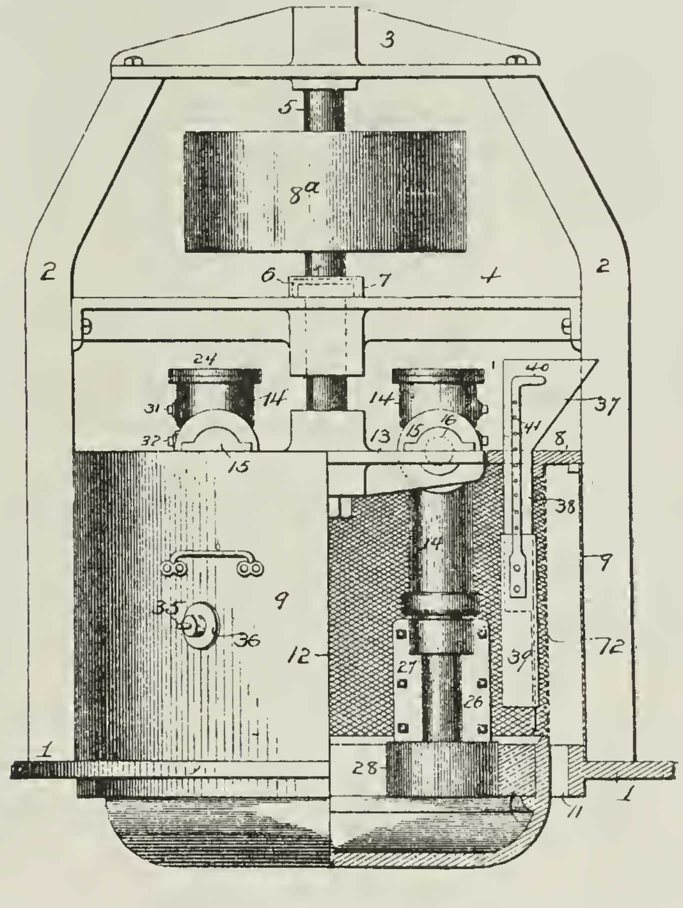
Claim.—A continuous dryer having an annular housing; means for heating the same; an annular table in said housing; a plurality of driving-wheels, located outside of said table; and a chain passing over said wheels and around said table for driving the latter.



In a continuous drier, the combination of an annular rotatable table; an annular housing therefor, consisting of concentric walls, each having a flue running lengthwise therein, said walls having apertures at frequent intervals forming passages from said flues to the interior of the housing; a plurality of furnaces connected to the flues in one of the walls of the housing; a plurality of stacks connected to the flue in the other wall of the housing at points remote from the furnaces, and cut-offs in the furnace-flues approximately midway between the different furnaces.

777,787. Pulverizing-Machine. Samuel Hughes, Summerville, S. C. Filed June 11, 1903. Serial No. 161,111.

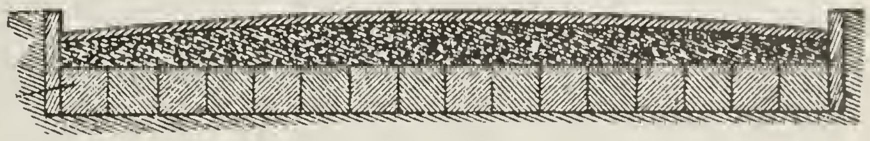
Claim.—1. A feed-hopper for grinding or pulverizing machines and the like, comprising a hopper having a fixed spout, an adjustable spout telescoping on the fixed spout, a longitudinal extension depending from the fixed spout to guide the adjustable spout, and means for securing the adjustable spout at any level.



2. In a pulverizing-machine, the combination with a screen through which pulverized material escapes, of beaters having cushioning portions, said cushioning portions disposed to directly engage the screen when forced inward.

777,858. Road or Pavement. Frederic J. Nash, New York, N. Y. Filed Apr. 6, 1903. Serial No. 151,235.

Claim.—1. A structure for roads and the like, comprising at least the following three layers: a lower layer, consisting essentially of sand-lime brick-blocks, an upper wearing layer, and an intermediate layer of sand-lime brick concrete, for substantially the purposes set forth.



11. A structure for roads and the like, having in combination with a sand-lime brick foundation, an intermediate layer, consisting mainly of sand-lime brick derivatives, a wearing-surface comprising a rocky mosaic of sand-lime brick in the cement, which secures the said mosaic together and to the said intermediate layer, whereby a structure is formed having the said block foundation with a hard wearing-surface, and consisting essentially of a single homogeneous substance, namely, sand-lime brick, for substantially the purposes set forth.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

Clay Record Publishing Company,
Ninth Floor, Plymouth Building,
303 Dearborn Street,
CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.
Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVI. FEBUARY 14, 1905. No. 3

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

Money in the purse dispels melancholy.

Have your plant in readiness if the weather gets so you can operate it.

The Clay Record is semi-monthly and has the largest circulation of any American clay journal.

Learn to lead the "simple life." Don't be always grasping for some imaginary crown that you admire very much and think might fit your head.

The time is at hand to consider what repairs, replacements, the plant needs to be in good shape at the opening of next season's running. We would suggest that this be taken up at once and your orders placed immediately for your needs, not only that the matter may be disposed of and off your mind, but that you may not experience a later disappointment in being late in starting up, because you were slow in ordering materials, and their delivery delayed because of the tardy execution of your orders at the shops. We are assured by many manufacturers that this season finds them very busy, and this being the fact, it behooves our readers to act promptly in this matter of getting the brick plant in shape for next season's business and ordering at once the supplies and repairs needed.

The questions of Tariff Revision and Freight Tariff Revision are certainly before the people as never before, and, unless all signs fail, will be thoroughly analyzed, the evils be brought to the surface, and the proper remedies be applied. The American people are weak in that they submit patiently for a very long time to contemptible treatment before they are aroused to demand what of right belongs to them. The President fortunately is a man who is on the side of the people, and has that backbone to fight, and fight valiantly, for the people's rights. What the people must do is to rally to his support; also must take hold of their respective representatives in Congress and give them to understand what must be done. It would seem that some of these representatives have developed in themselves an idea of their superiority, or a feeling that the people are nothing. If these Congressmen are wise they will heed the signs of the times; if they do not, the next Congress will be composed of others than themselves, so sure as the time rolls around when new men can be chosen.

Some time ago, in an editorial, we had something to say about a matter, which the daily press is now emphasizing, and which will be remembered and recalled by the careful reader on reading this.

There has been for a long time much speculation as to the fact, observed by many, how it was that there were a few men, easily counted on the fingers of one's hands, whom it seemed were exploiting all the schemes involving immense sums, running up into the hundreds of millions, and further executing these schemes being provided with all the money required.

We said, in the editorial referred to, that it seemed patent that these few men were being favored; that they could command and use, when they wished, the accumulations in the trust and savings funds in this country; blaming the people for making it possible; advising withdrawal from the savings and the life insurance trust funds, etc., and urging them to appeal to and demand of Congress the establishment of a "parcels post" system on the lines of the English system, if a better could not be worked out.

What this system is our readers may easily find out, and we earnestly hope they will, for it will amply repay them in surprises; and comparing the like facilities in this country with English, there will be no longer any boasting of what this nation's government has done and is doing for the people in these lines.

We should like if space permitted to go into details, but we cannot, and having space for a few general remarks only, beg to say that the banking, insurance, industrial and manufacturing interests are largely manipulated, controlled and influenced by a few big men; that this influence controls, commands and uses the vast accumulations of money, and ever at the expense of the people, and will continue until the masses shall rise in their might and power, by fair means or foul, and rid themselves of the men now prominent in the management and control of federal and state affairs.

Many years ago Wm. H. Vanderbilt, son of Cornelius Vanderbilt, the founder of the Vanderbilt estate, when informed of a request of, or a demand upon him, from the people, his reply was more forcible than elegant: "The public be damned." At the time this reply was made known it was generally regarded the gentleman was suffering from headache or indigestion, and thought lightly of it, but as the days go by, many, recalling this circumstance in the light of what has been and is now happening, now regard Mr. Vanderbilt's remark as a truth spoken, reflecting his true estimate of the people, and the number is legion of those who to-day hold the same opinion.

What are you going to do about it?

ACCIDENTS, DAMAGES AND LOSSES.

At J. M. Jenkins' Brick Works, Wetumpka, Ala., Frank Norris lost his life in the clay pit by the frozen clay falling upon him.

While two men were at work on the roof at the new building of the Howard (Pa.) Brick Co., the same gave way and the men were buried under the debris.

The Wilmington Trust Co. will wind up the affairs of the Hocessin (Del.) Kaolin Co. The general creditors will receive only a few cents on the dollar.

Attorney Bryant Walker bought in the two plants of the Hall Brick Co., at Detroit, Mich., for $7,500. The creditors will not receive 5 cents on the dollar for their claims.

At the Eagle Brick Works, one-half mile from Mill Hall, near Lock Haven, Pa., Harvey Lannen, an employee, was badly crushed beneath a fall of slate and rock. He was taken to the hospital in an unconscious condition.

The brick plant at Colorado Springs, Colo., owned by F. C. Schrader, was looted by thieves and all the brasses, copper wire and things about the plant that could be taken away were carted off. It will cost over $1,000 to repair the plant.

The Fiske Brick Co., Boston, Mass., is petitioned into involuntary brankruptcy by three creditors whose claims aggregate $3,000.

Perry Hazen, watchman at the Cincinnati (O.) Brick Co.'s plant, was burned to death when fire of unknown origin destroyed the office and a shed over the kilns.

FIRE! FIRE!! FIRE!!!

For the second time within two months the large plant of the Monmouth (Ill.) pottery faced destruction by fire. The prompt response of the city fire department saved the large buildings from being burned.

The Nealeton Brick Works, near Kittanning, Pa., owned by the Latcher Company, was destroyed by fire to the extent of several thousand dollars.

A dry kiln and brick works, part of the Garbutt Mill, at Wright, near Fitzgerald, Ga., was destroyed by fire, causing a complete loss. No insurance.

BY-PRODUCTS IN CEMENT MAKING.

It is difficult to foretell to what strange conditions a development of the by-products of an industry will lead. The blast furnaces of Scotland, for example, depend so largely on the sale of heavy chemicals for a revenue that their pig iron approaches the grade of by-product. In the United States, the manufacture of Portland cement from slag has been so developed by the Illinois Steel Company that it is by no means unlikely it is at some seasons a more important commercial proposition than the production of pig iron.

It cannot be said at the present time, so far as *The Engineering Record* is aware, that a really thorough study of the utilization of the gases of the rotary kiln has ever been made. Some work has been done, but of a preliminary nature, like that outlined by Messrs. Clifford Richardson and Richard K. Meade at the last convention of the American Society for Testing Materials. These two chemists, as well as others who have made public results of their studies, have confined their attention mainly to the recovery of potash and soda. More recently Mr. Bernard Enright of South Bethlehem has made studies with the idea of recovering the carbon dioxide, which is now sold in liquid form in cylinders at about 35 cents a pound.

According to Mr. Enright about 33 per cent of the raw materials entering the kiln pass up the chimney as carbonic acid. In a 5,000-barrel plant, this is estimated to represent the waste of 427 tons of carbon dioxide daily. In addition the burning of the coal will generate about 657 tons of the same gas, so that in all 1,084 tons are discharged daily from such a mill when running full. The degree of dilution of this gas at many plants renders its recovery unprofitable, but Mr. Enright is of the opinion that improvements in kiln practice and the passage of the rotary kiln gases through vertical kilns filled with limestone may be expected to furnish a gas containing perhaps 28 per cent of carbon dioxide.

W. C. Mitchell, Consulting Clay Engineer, Edwardsville, Illinois, has out Catalogue "B." It deals in kilns and direct and waste heat dryers that are designed and constructed by Mr. Mitchell, who is very well adapted for this work. He is not a theorist, but a practical man. If you are having trouble with your kilns or dryers it might be to your advantage to correspond with him.

MAGNESITE IN CALIFORNIA.

The discovery of magnesite in California in great quantities in one locality and indications of the mineral in other localities, together with the fact that California contains a vast deposit of iron ore found in Fresno county and known as the minarets, indicate that some day California will become a great producer of steel and iron.

Magnesite is the mineral used in the manufacture of fire brick, which can stand the extreme heat necessary in the reduction of iron.

Thirty miles southeast of Livermore, in Santa Clara and Stanislaus counties, and near the Alameda county line, are the largest commercial deposits of magnesite yet discovered and the only deposits in the United States. At present all iron-reducing furnaces in the United States are lined with brick, made from magnesite brought from the foreign deposits, which occur in commercial quantities in three places—the Island of Euboea, Greece, in the Mediterranean sea; Carl Spraeter's, at Veitsch, Hungary, and in Austria. The United States, however, gets its magnesite mostly from the Grecian and Syrian deposits. The most important uses for magnesite at the present time include the manufacture of carbonic-acid gas, of refractory fire brick, of fireproof building material (arilite-petramite), of magnesia boiler covering and of magnesia cement. The deposits of magnesite referred to will be vigorously worked by a closed corporation, whose capital has all been fully subscribed.

The magnesite deposits occur in the serpentine belt, which is so prominent throughout the coast range. This serpentine is capped with a metamorphosed sandstone, which has eroded to such an extent as to cover the sides of the mountain from a depth of two to twenty feet. The sandstone, containing a high percentage of oxidized iron, gives a red appearance to the mountain, from which is derived the name "Red Mountain."

The magnesite outcrops boldly on the sides of the mountain, running across in apparently parallel ledges, and only hidden now and then by the eroded sandstone. So extensive and regular are the croppings, and so uniform is the dip, that at first sight they would unquestionably be taken for ledges. In one instance, in a development, a gouge of two inches was found upon one of the walls; however, upon close examination, it was found that the entire mountain had been tilted through an angle of about 80 degrees from the horizontal, thus showing that the magnesium carbonate is simply an inverted deposit, the gouge having been formed by the movement upon the wall.

Mineral deposits all differ from one another in some respects, and it is, therefore, most difficult to exactly classify them. It is only by taking a general or perspective view of a large number of particularly similar cases that any broad general laws can be deduced.

Since magnesite occurs in so few places in the world, theories concerning its origin and occurrences must necessarily lack the conclusiveness and finish that they would have if there were more cases to which to apply them. The opening up of the California mines will undoubtedly throw more light on the question. However, the chemical properties of magnesium compounds permit certain general conclusions about the possible creation of magnesium carbonate to be drawn.

Magnesia fire brick, manufactured but in one place in the United States, costs from $160 to $200 per thousand f. o. b. at New York. These prices, increased by freight expenses, make them very costly on the Pacific Coast, where imported, and local clay fire-brick cost from $25 to $40 per thousand. The magnesite brick is, however, cheaper than the clay brick, even at these figures, when one takes into account the life of each. Take for example the case of an ordinary oil-burning locomotive. A clay brick lining lasts on an average but ten days, while magnesite bricks will stand three months, and then fall in only on account of the constant jarring of the locomotive, and not from fusing, as in the case of the clay brick.

FIRE-BRICK INDUSTRY OF NEW JERSEY.

New Jersey fire brick enjoy a high reputation among all manufacturers, not only for their high degree of refractoriness, but also for their toughness, durability, and power to withstand rapid heating and cooling. The centre of this industry is located in Middlesex County, in the vicinity of Woodbridge and Perth Amboy, although fire brick are made elsewhere in the state. Furthermore, not a few of the fire brick made in New York and Pennsylvania are made from New Jersey fire clay.

In order to determine the refractoriness of New Jersey fire brick and its relation to their chemical composition and texture, and possibly to discover certain facts which would be of assistance to fire-brick manufacturers, a full series of analyses and tests has recently been made under the direction of Dr. Henry B. Kummel, the state geologist. Samples of nearly all the brands manufactured in the state were obtained. These were chemically analyzed and also tested to determine their fusibility. The best brands did not fuse below the melting point of Seger cone 33, about 3,250 degrees F., while even the third or fourth grade of brick withstood temperatures of over 3,000 degrees F. These results compare very favorably with fire brick from other states, and in the few cases where the New Jersey brick are surpassed in refractoriness they often excel in toughness and durability.

A comparison of the chemical composition with the fusion tests shows that many brick melt at higher temperatures than would be expected from the amount of silica which they contain, for a long series of experiments has demonstrated that silica, although very refractory alone, acts as a flux when mixed with kaolin in clay. The fact, however, that the silica is present largely in coarse grain and not finely divided, accounts for the greater resistance to fire. The fluxing action of silica is most effective when the quartz grains are very coarse. This was demonstrated by the fact that when the fire brick which fused at 3,218 degrees F., was ground up very fine, so that the silica grains were pulverized and thoroughly mixed with the kaolin, and the brick then remodeled and tested, it fused at 3,000 degrees F.

The practical importance of this to fire-brick manufacturers is very great, since all of them add various amounts of silica, in one form or another, to their brick. At best it is an injurious substance so far as the fusibility is concerned, but if added at all it should be in a coarse condition, in order to insure high refractoriness, not as fine sand. The most rafractory brick made in this country, however, and in Europe, contain less than the New Jersey brick.

The complete discussion of these tests, with much other information regarding fire clays and the fire-brick industry, is contained in Volume VI. of the Survey Reports, which can be obtained from the state geologist, Trenton, N. J.

A COMMERCIAL MORAL.

An interesting transaction and one which points a moral, is that just concluded, whereby the New Jersey Sand-Lime Brick Company has purchased from Mr. Christian J. Larsen his sand-lime brick plant, situated at Charleston, S. C. This plant was erected by the Schwarz System Brick Company of New York, and put into operation early in 1904. This was the first plant erected by the Company and hence does not exhibit any of the later-day improvements of the plants now being built. The Company was handicapped in many ways, as for instance, being compelled to import some of the machinery, as well as some of the help coming from abroad. The machinery while containing the essential features which go to make the plants of this Company so superior, was not the machinery of such high development as American engineers connected with this Company have since made it, and the superintendence of these installations and starting by the impractical German were much against it. The plant when in operation failed to prove a financial success, due undoubtedly to some fault in the management, as the bricks made by this plant were those exhibited at the fair in St. Louis and for which the Louisiana Purchase Exposition awarded the Schwarz System Brick Company of New York the Grand Prize. Herein is the moral, that an article which, in the language of the official notification of the Louisiana Purchase Exposition, was "without an equal," it having received "the highest award that the world can give for the excellence of the product," could not be made a financial success undoubtedly proves the lack of business ability in the management. As above stated this plant has been bought for the New Jersey Sand-Lime Brick Company. Mr. R. Napier Anderson, a well-known architect of New York, was appointed by this Company to make a tour of the different plants operated under the various systems now working in this country. Mr. Anderson visited plants which were only recently erected and hence had the advantage of the experience which the different companies have had in the past year. Despite this fact the first plant erected by the Schwarz System Brick Company, and which is not the type of the later-day plants, it not approaching in excellence these newly built plants by many points, yet as already said, despite this fact this old plant of the Schwarz System Brick Company won out over those of the others and as a result the New Jersey Sand-Lime Brick Company purchased the plant to bring it nearer New York and get commercial results out of goods which the Louisiana Purchase Exposition has said are without an equal in the world.

POTTERY NEWS ITEMS.

The Longview (Texas) Pottery, owned by J. P. Donaldson, which recently burned, will be rebuilt.

The Knoxville (Tenn.) Pottery Co. has let the contract for building of their plant at Oakwood. They hope to break ground this week.

The Owen China Company, Minerva, O., has captured the gold medal at the Louisiana Purchase Exposition for the finest quality of semi-porcelain in the world.

It is rumored that the Bell Pottery Company, at Findlay, O., will remove to Columbus, where a location has been secured in the eastern part of the city.

The big and little pottery manufacturers are at odds on the question of a uniform selling price list now in force. The smaller manufacturers favor an open list.

The Dresden China Co's. plant at Salineville, Ohio, which has been idle for a year, is to be placed in operation by a new management. C. J. Albright of Sebring will be the general manager.

The Sevres China Co. of East Liverpool, Ohio, has purchased the business and plant of the Derry (Pa.) China Co. The new management will take charge at once and the main office will be at East Liverpool.

The Norse Pottery Company, Rockford, Ill., has leased the building at 111 South Water street, Rockford, Ill., and will begin active operations in January. This pottery was moved from Edgerton, Wis.

The Benton (Ill.) Pottery Company is one of the industries that has sprung up in that section of the country. The officers are W. S. Cantrell, president; A. L. Eskew, secretary and treasurer, and O. D. Harkrader, foreman. The plant is at the McKenzie Brickyard.

WILL MAKE BRICK AND TILE BY A SECRET PROCESS.

F. B. Huckstep, of Des Moines, Iowa, has organized The Eureka Brick, Roof & Floor Tile Company, and incorporated for $35,000. The company have first-class machinery, and wil make pressed brick, roof and floor tile. Both brick and shingle press is now running. The product is made from shale at deserted coal mines, by a secret process, of which F. B. Huckstep both owns and controlls, and is also superintendent and manager of said company. These goods can be made one day and placed in the wall or on the roof the next day. No burning, drying or cooling off, which saves the brickmaker an enormous expense. The company is now receiving orders for the spring trade, the brick having been fully tested and found good, which process seems to be not only a success, and Mr. Huckstep is greatly elated over his new invention, which is a marvel to the brickmakers.

◆

The Wisconsin Brick Co., Madison, Wis., has been incorporated with $50,000 capital stock by A. F. Menzies, T. C. McCarthy, J. E. Conklin and H. A. Smythe, Jr.

LIME OR SAND BRICK OR BLOCK NEWS.

Owensboro, Ky. will have a new sand-lime brick plant in the near future.

The Lorain (O.) Sand & Gravel Co. has been incorporated to make brick and plaster and has bought 40 acres of land.

The Houston (Tex.) White Sand Brick Co., previously reported, has secured a permit to build a $50,000 factory.

Stearns, Ky., and some Michigan capitalists are figuring on building a sand-lime brick plant at the former place.

H. T. Anderson, Lake City, Ia., is having his sand tested with a view of putting in a sand brick plant.

Messrs. Walton of Hummelstown, Pa., have staked out land for a sand-lime brick plant that will cost $50,000.

The Waterloo (Ia.) Granite Brick Co. will soon be incorporated with $25,000 capital stock. They will make sand-lime brick.

Hollidaysburg, Pa., is to have a $50,000 sand-lime brick plant. Charles F. Brown and others have leased land at Frankstown for this purpose.

The United States Brick Corporation, who are to build a sand brick plant at Michigan City, Ind., have opened an office in that city. G. W. Gibson is the president.

The Ft. Wayne (Ind.) Pressed Brick Co. founded by Alexander Johnson and some local capitalists, has been sold to Geo. T. Butler and others, and will be converted from a cement brick to a sand-lime brick plant.

R. F. Doyle of Chicago, and Capt. W. H. Becker of Menomonie, Wis., are promoting a sand-lime brick company for Eau Claire, Wis., where splendid sand has been found.

The Colorado Brick & Artificial Stone Co., Colorado Springs, have their plant up and have made the final tests which are very satisfactory. Clark Mellen is the president of the company.

The Minneapolis (Minn.) Paving & Cement Brick Mfg. Co. has been incorporated with $100,000 capital stock. The incorporators are P. J. Nyvall, John Olson, A. Anderson and J. B. Beekman.

The Cement Block & Supply Co., Marietta, O., has been incorporated with $10,000 capital stock. The officers are: C. J. Van Valey, President; J. L. Mills, Vice President; P. J. Sult, Secretary and Treasurer, and O. Ballard, General Manager.

The Diamond Brick Co., Muncie, Ind., will have their plant in operation within a few weeks. The company is capitalized at $40,000, with B. W. Bennett president.

SEWER PIPE FOR THE PANAMA CANAL.

The American Sewer Pipe Company of East Liverpool, O., has been awarded a contract for supplying 1,200 car loads of sewer pipe to be used on the Panama Canal. The contract calls for early delivery and the company has already started the work. To the Pennsylvania Railroad Company has been given the contract for transporting the pipe to Cincinnati, whence it will go to New Orleans over the Illinois Central. It will require thirty trains of forty cars each to haul the pipe from the mills to the ships at deep water.

MISCELLANEOUS ITEMS.

Tom C. Meader, ex-Clerk of Courts, Eldora, Ia., has bought a half interest in the Eldora Tile Works.

John Cummins and Mall Imbody have bought ground at Green Camp, O., and will build a tile works.

J. M. Shawber has contracted with Bellefontaine (O.) parties to build a tile factory at Lakeview.

The Eagle Tile Works, at Keyport, N. J., has been sold to F. A. Emerick, a contractor of New York, and the plant will be put into operation.

The United States Brick Company, Reading, Pa., has decided to erect a plant at Baltimore, Md. Albert A. Gery is president.

George E. Carlyle and others, of Portsmouth, O., have bought land near the Driving Association Grounds, and it is expected that a brickmaking plant will be built.

C. S. Speese, Gettysburg, Pa., proprietor of the Gettysburg Drain Tile Works, is in the market for stiff mud brick machinery.

Thomas Asher, West Louisville, Ky., will install a small brick-making plant in the spring and wants machinery for same.

It is reported that Fendick & Thies, who recently sold their brick and tile works at Woodson, to William Kitner, will engage in the manufacture of brick at Jacksonville, Ills.

The directors of the Corn Creek Coal Co., Clinton, Mo., have decided to put in a plant for the making of paving brick.

The Mobile (Ala.) Brick Company has been incorporated with $50,000 capital stock. Sidney Lowenstein is president, James T. Duggan vice-president, and J. L. Taylor secretary and treasurer.

The Kilgore-Peteler Co., Minneapolis, Minn., has absorbed the Kilgore Machine Co. and the Peteler Portable Railway Mfg. Co., both of Minneapolis. They will manufacture both steam shovels and dump cars.

J. C. Melcher, O'Quinn, Tex., has lately discovered two more large deposits of blue and yellow shales, overlaying heavy beds of lignite coal. These shales will make fine paving brick.

The Spears Brick Co., New York City, has been incorporated with $100,000 capital stock. The directors are Bernard M. Ernst, Frederick Mellor and F. G. Bamman. The office is 152 W. 122nd St.

A. P. Taylor has returned to Fresno, Cal., and is the manager of the Western Brick Co., which has bought 20 acres of clay land and is building a 60,000 brick daily capacity plant.

The Columbus (O.) Contractors' Supply Co., which recently merged with the Franklin Brick Co., has elected D. W. McGrath, President; E. Doddington, Vice President; Frank Hunter, Secretary, and P. L. Schneider, Treasurer.

At the annual meeting of the Flint Valley Brick & Coal Co., Des Moines, Ia., Will H. Brecht was elected President; C. W. Menning, Vice President, and E. A. Brecht, Secretary. Several improvements will be made at the plant.

Rob. Crisinger and John Storm have bought a tile factory near Mt. Pleasant, Ia., and will move there in the spring.

W. G. Wheatcroft, Grayville, Ills., will enlarge his steam brick plant to double its present size.

The Dysart (Ia.) Brick & Tile Works will undergo some radical improvements this spring.

The Union Brick & Gas Co., Cherryvale, Kan., has been incorporated with $200,000 capital stock.

S. E. Linkirk of Reynoldsville, Pa., is reported to have organized a $150,000 company for East Bernstadt, Ky.

J. P. Gosseraud has purchased and will improve and operate the New Roads, La., Brick Co.

The Lehigh Portland Cement Co. will spend $500,000 in a cement plant at Mitchell, Ind., this year.

The Arcadia (La.) Light, Lumber & Gin Co. has ordered a brick manufacturing plant to make 20,000 brick daily.

George R. Leach, Golden Gate, Ills., will enlarge his brick plant and double its output. Capt. W. D. Green will superintend the work.

The Buckhorn Portland Cement Co., at Manheim, W. Va., is being rebuilt. The plant was burned several months ago and was controlled by John T. McGraw.

The Sibley Brick Co., Birmingham, Ala., is said to commence the building of a modern dry press brick plant within the next month that will cost $30,000.

P. M. Johnson, the proprietor of the St. Elmo (Ill.) Brick Works, is likely to install a dry press in his plant in the spring.

The Oblong (Ill.) Mfg. Co. has been incorporated with $7,000 capital stock to manufacture brick. Incorporators are W. C. Cortelyou, Henry Wirt and C. J. Kirk.

Simon Kline, the well known brick manufacturer, of Reading, Pa., has leased the old Boyer clay plant on Lancaster Avenue.

W. O. Bacon, Greenwood, Miss., is organizing a brick and tile factory in that city, to be known as the Greenwood Brick & Tile Co.

The Uniform Brick & Clay Co., New York, has been incorporated with $200,000 capital stock. Directors are Joseph Nordenschild and Charles S. Bloch, of Brooklyn, and Henry Konperl, of New York.

R. F. Smith, Belle Plaine, Ia., has bought a brick plant in the western part of the state and will ship part of his present machinery there and will buy new machinery to equip the Belle Plaine plant.

Scott Diebert of Johnstown, Pa., president of Mt. Union Silica Brick Co., has purchased the interests of the other stockholders and is now the sole owner of the plant and has made arrangements to enlarge it.

The Springfield (Ill.) Electric Pressed Brick Co. has been incorporated with $25,000 capital stock. The officers are J. G. Underwood, President; Pluto McCourtney, Secretary and Treasurer, and I. N. Martin, of Peoria, and T. L. Greer of Canton. They have bought ground adjourning the West End Coal Co.'s shaft.

James L. Walker of Dublin, Ga., has sold his tile factory to W. F. Smith.

Mayor Hembold has bought the Tippenhauer Brick Yard, in the West End, Newport, Ky., and will make brick on a much larger scale.

G. E. Carlyle has resigned as vice-president of the Harbison-Walker Co., at Portsmouth, O., and with others have bought land and will build a large paving brick plant.

The Wisconsin Brick Co., Madison, Wis., has incorporated with $50,000 capital stock, by A. F. Menges, T. C. McCarthy, James E. Conklin and H. A. Smythe.

The Shenandoah (Ia.) Brick & Tile Co. is making improvements to their plant that will bring the annual capacity up to 5,000,000 brick.

The Athens (Wis.) Brick & Tile Co. has been incorporated with $10,000 capital stock. Incorporators are Fred Rietbrock, Joseph Braun and Frank Veitenhaus.

The Simons Brick Co., Santa Monica, Cali., have their machinery on the ground for their new brick plant on the east side.

The Celedon Roofing Tile Co. have sold their Ottawa (Ill.) plant to F. E. Swife, of Dayton, O., who will convert it into a paving brick plant.

The Harvey (Ia.) Brick & Tile Co. has filed articles of incorporation with $21,000 capital stock. G. W. English is President, and T. J. Neiswanger, Secretary and Treasurer.

The American Clay & Fertilizer Co., Cleveland, O., has been incorporated with $50,000 capital stock, by C. W. Newbrand, W. C. Doolittle, S. E. Ulmer, M. H. Ball and J. G. Herman.

The United States Brick Co., Reading, Pa., has decided to build at New York a brick plant that will cost $1,500,000. They have secured options on two sites on the Hudson River.

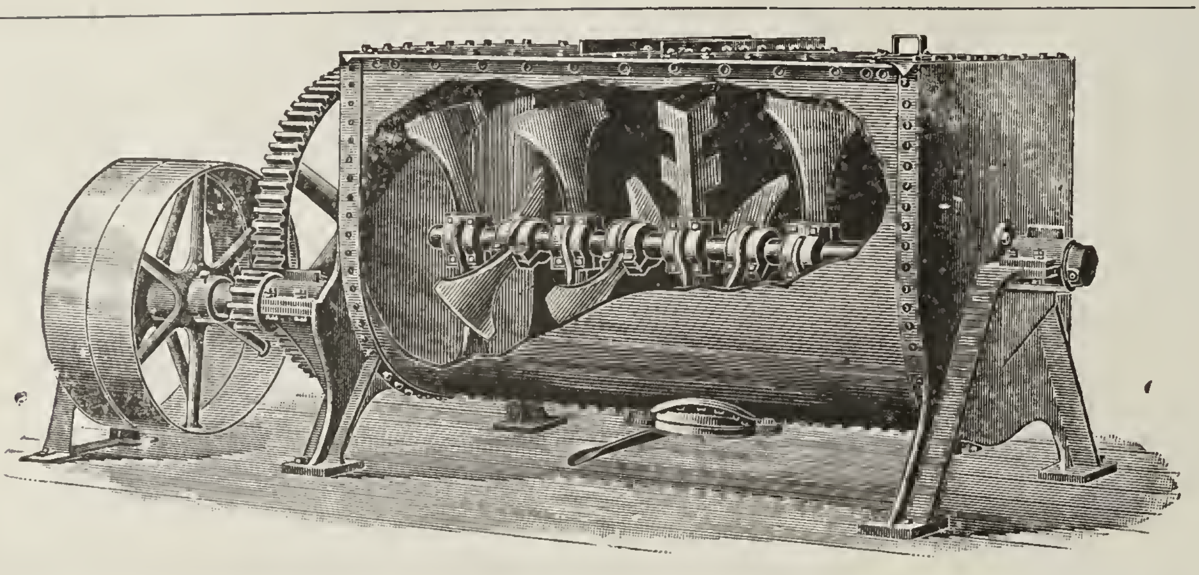
The Union County Pressed Brick & Tiling Co., New Albany, Miss., has been incorporated with $25,000 capital stock. J. T. Baker is President, D. H. Hall, Vice President, and T. F. Baker, Secretary and Treasurer.

The K. & K. Brick Co., Los Angeles, Cali., has been incorporated with $120,000 capital stock. Directors are C. J. Kubach, Henry W. Keller, Walter F. Haas, Harry P. Simons and E. W. Boehme, of Los Angeles.

The Wisconsin Clay Products Co. will be formed to work the clays at Whitewater, Wis. The promoters are W. H. Powell & Son, Milwaukee, and Prof A. Straussman and the Burnham Brick & Supply Co.

The Olphons Custodis Chimney Construction Company, of New York, have opened up an office in the M., K. & T. Building at Kansas City, Mo. The company now has a plant that will make 70,000 brick a day. M. F. Erbs is the manager.

The Colorado Fire Clay Co., Denver, Colo., has been formed with $1,000,000 capital stock. The officers are: President, W. A. Bittman, of Marion, Ind.; Vice President, Theo. Marx, of Denver; Secretary, E. Ward; Treasurer, A. J. Spengel.



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Both styles of cars in first-class repair.

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1 Raymond Victor double die steam repress.
1 Raymond Columbian double die steam repress.
1 American Clay Working Machinery Co. Eagle double die steam repress.
3 Bonnot double die steam represses.
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1 four-mold Boyd Dry Press, new.
All in thorough repair.

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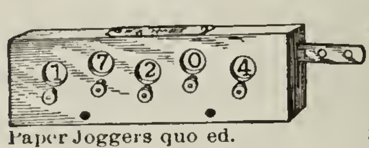

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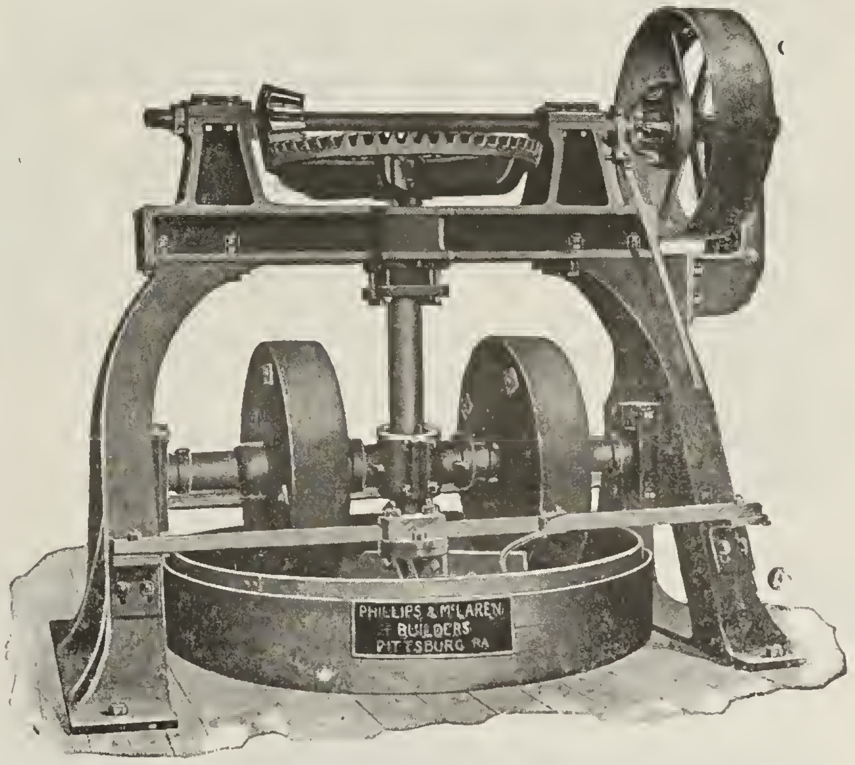

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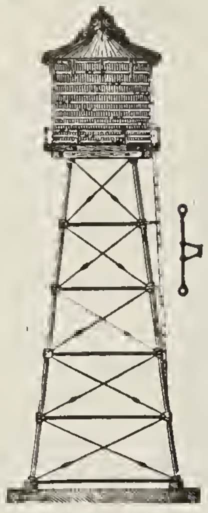

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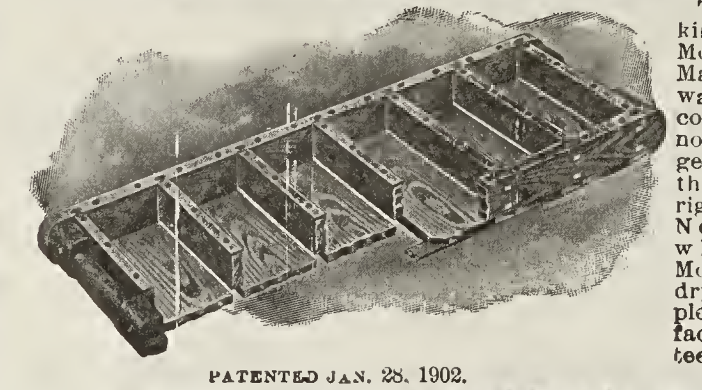

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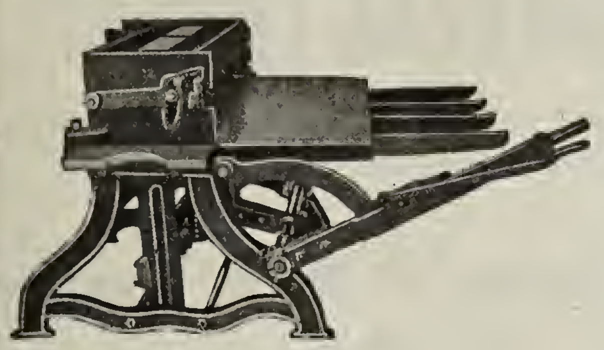

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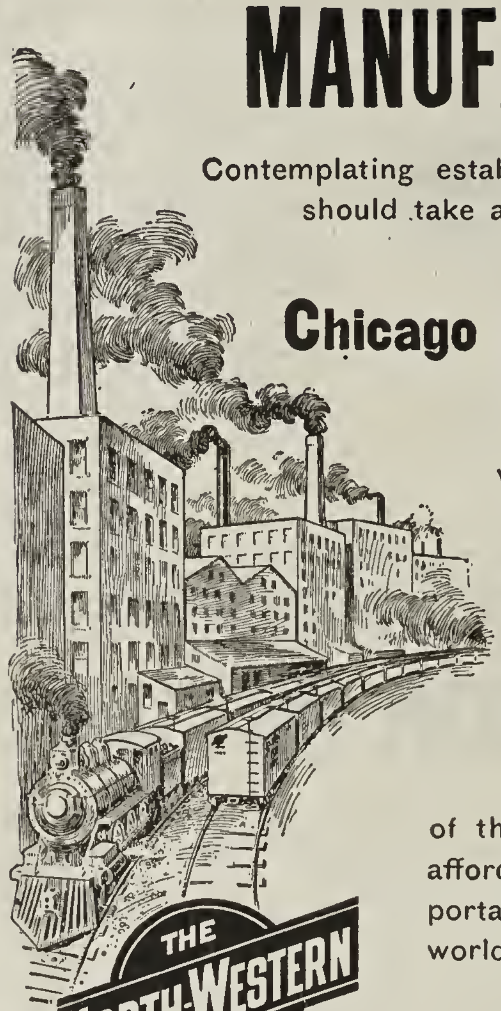

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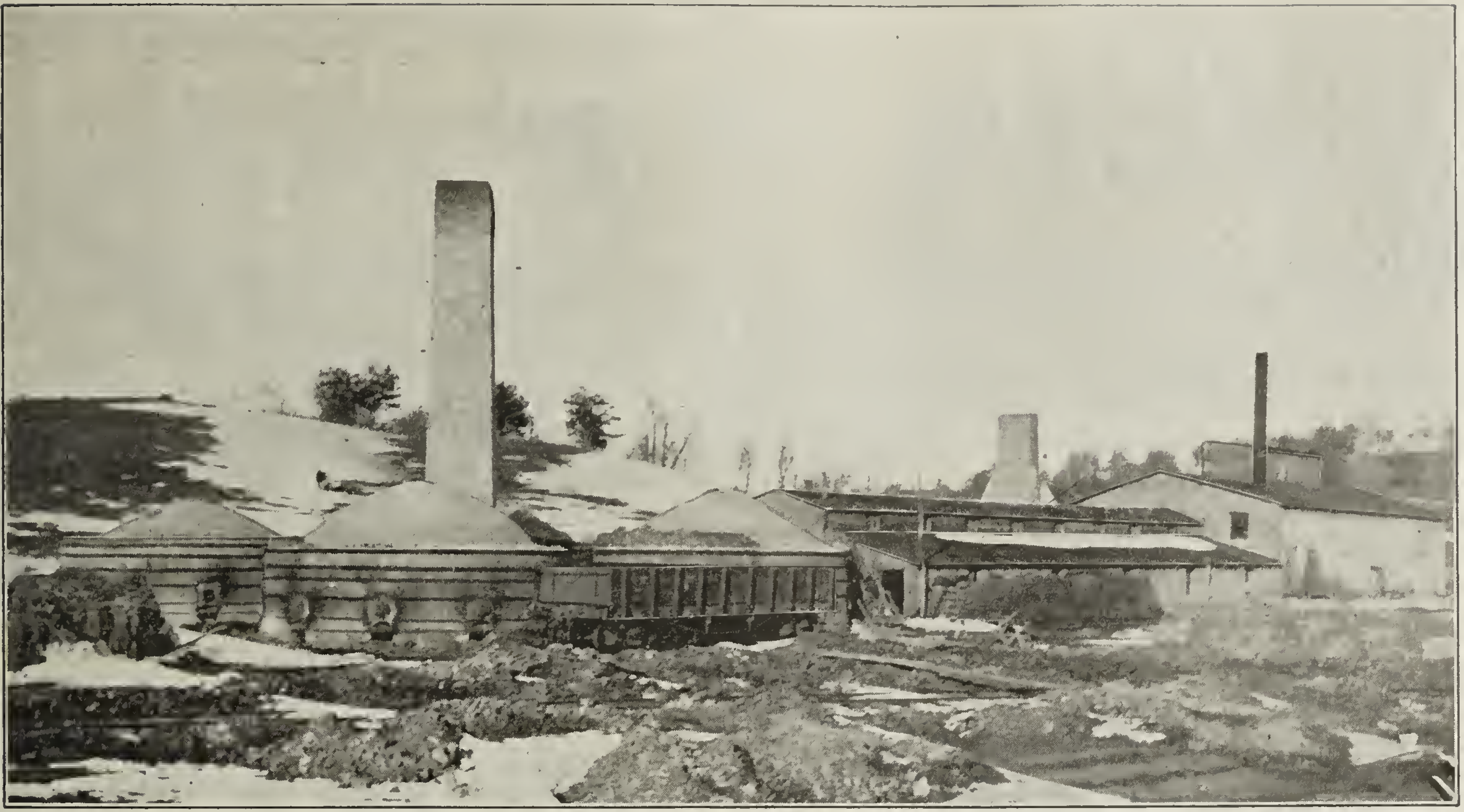

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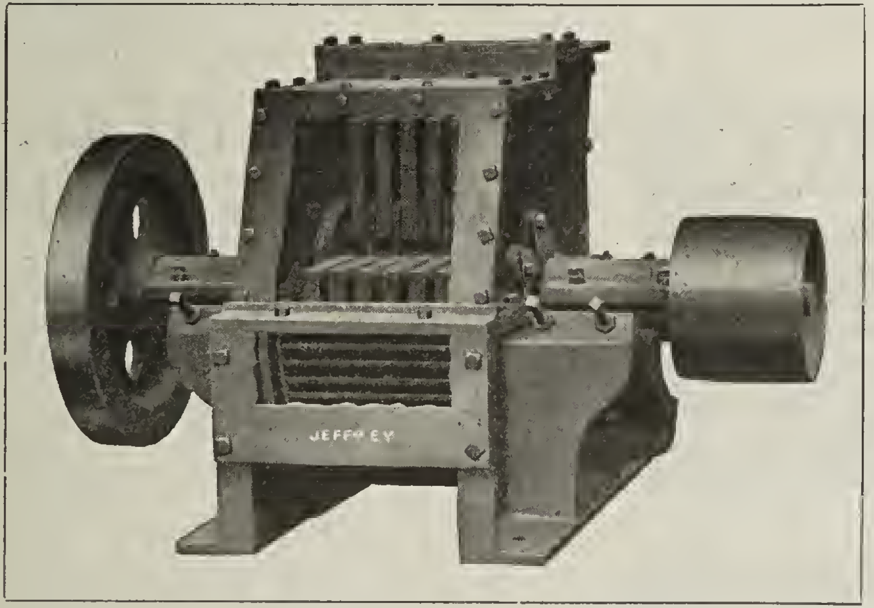

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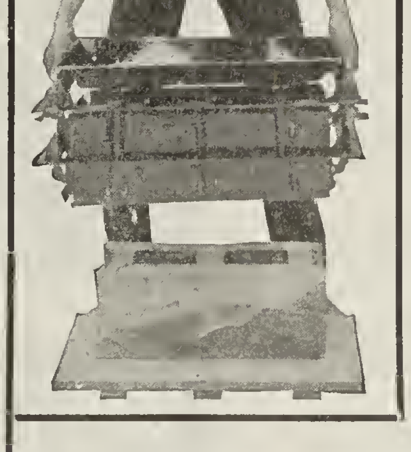

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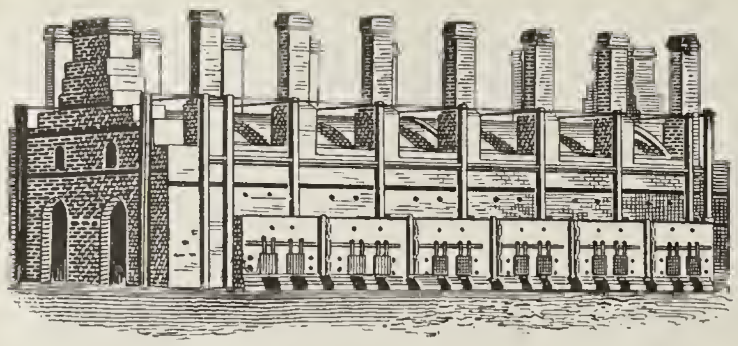

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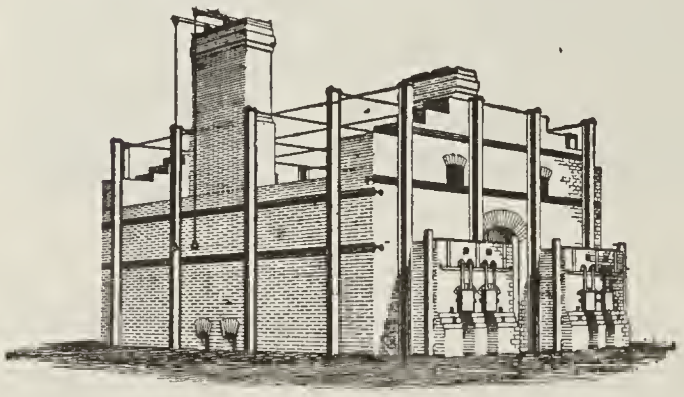

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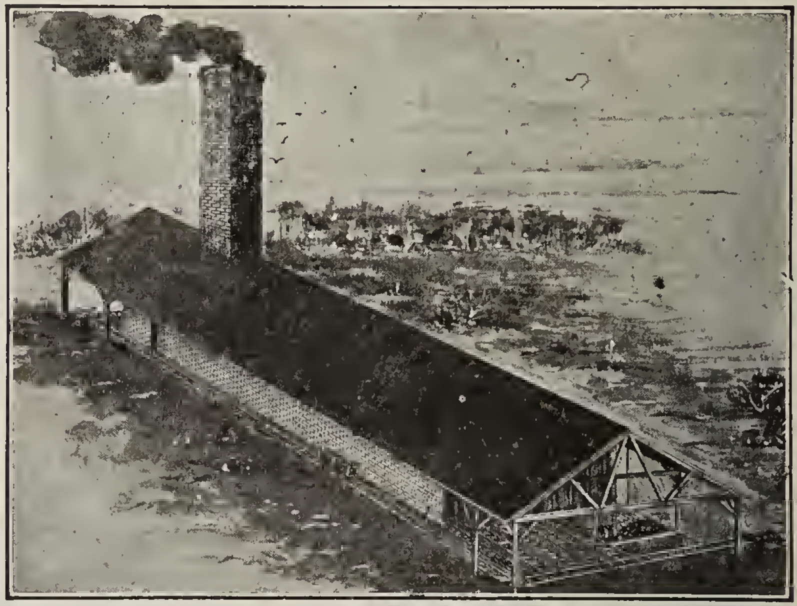

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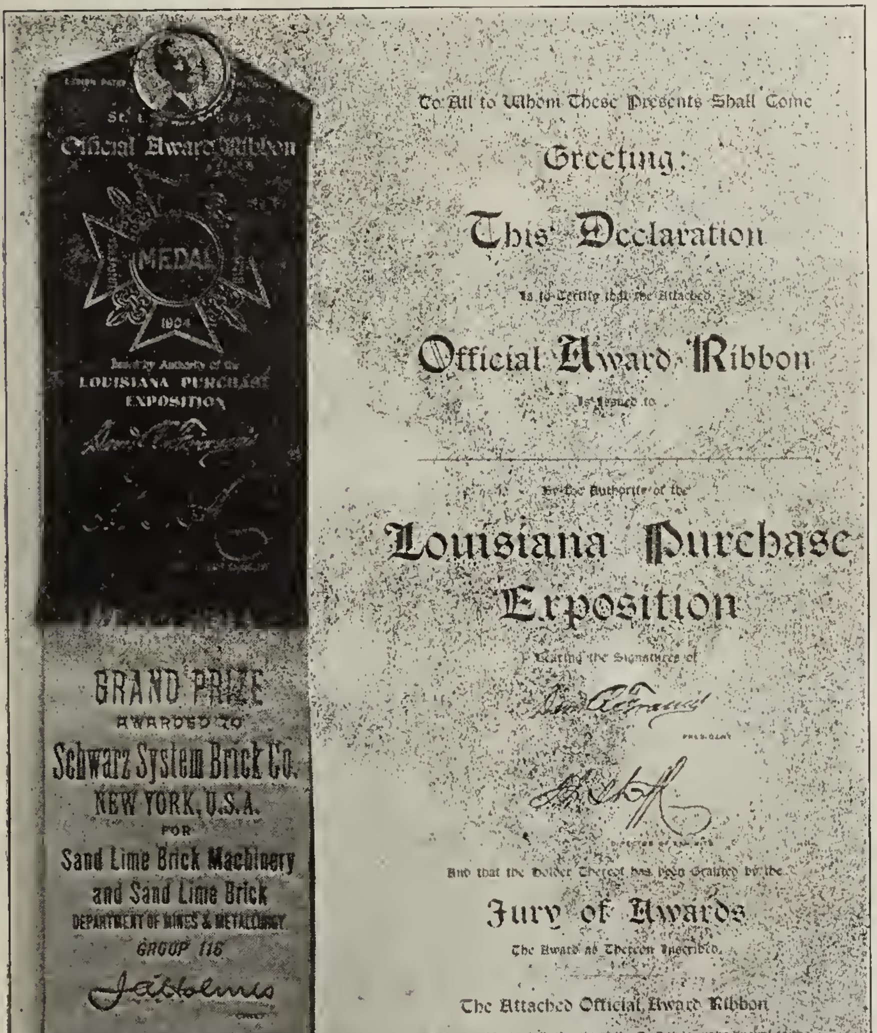

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FOR
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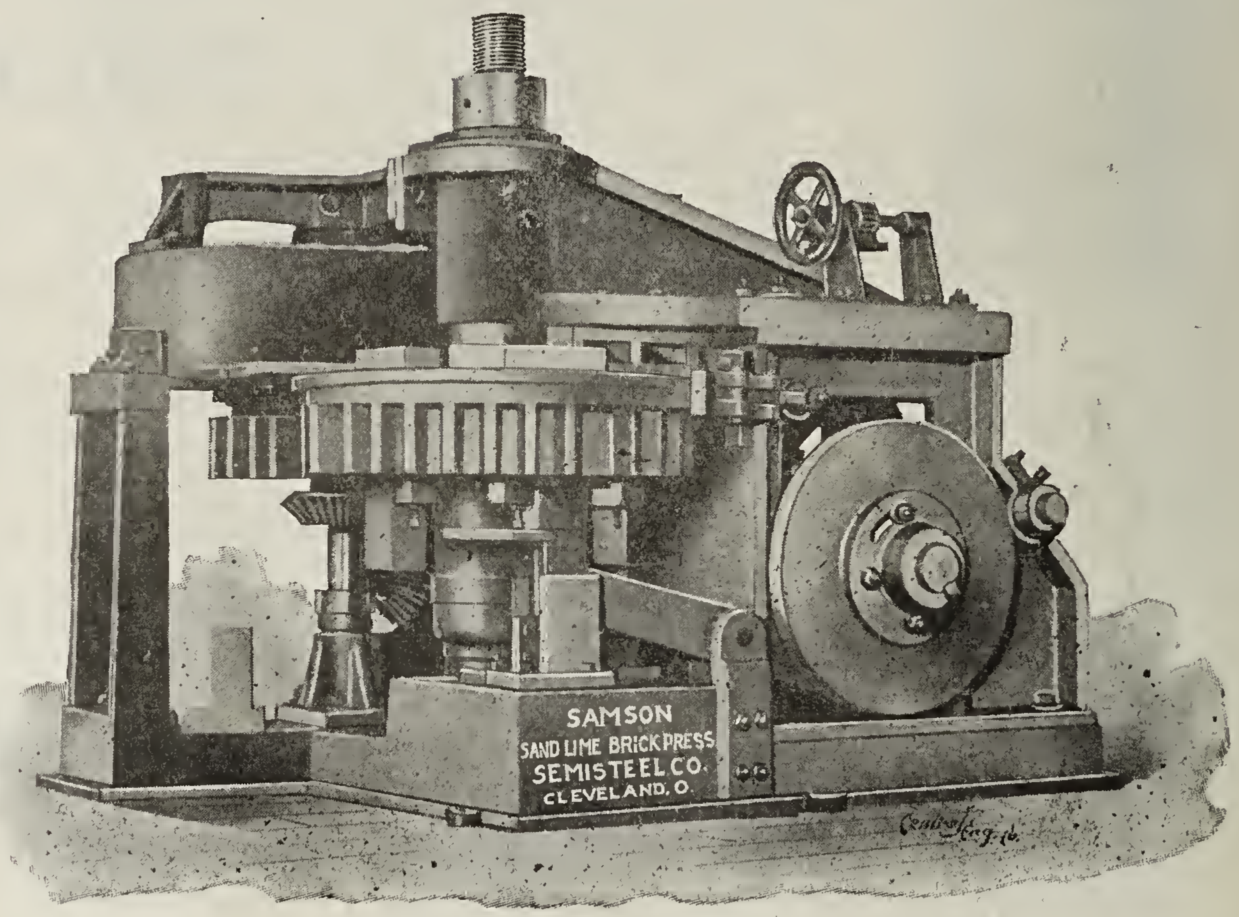

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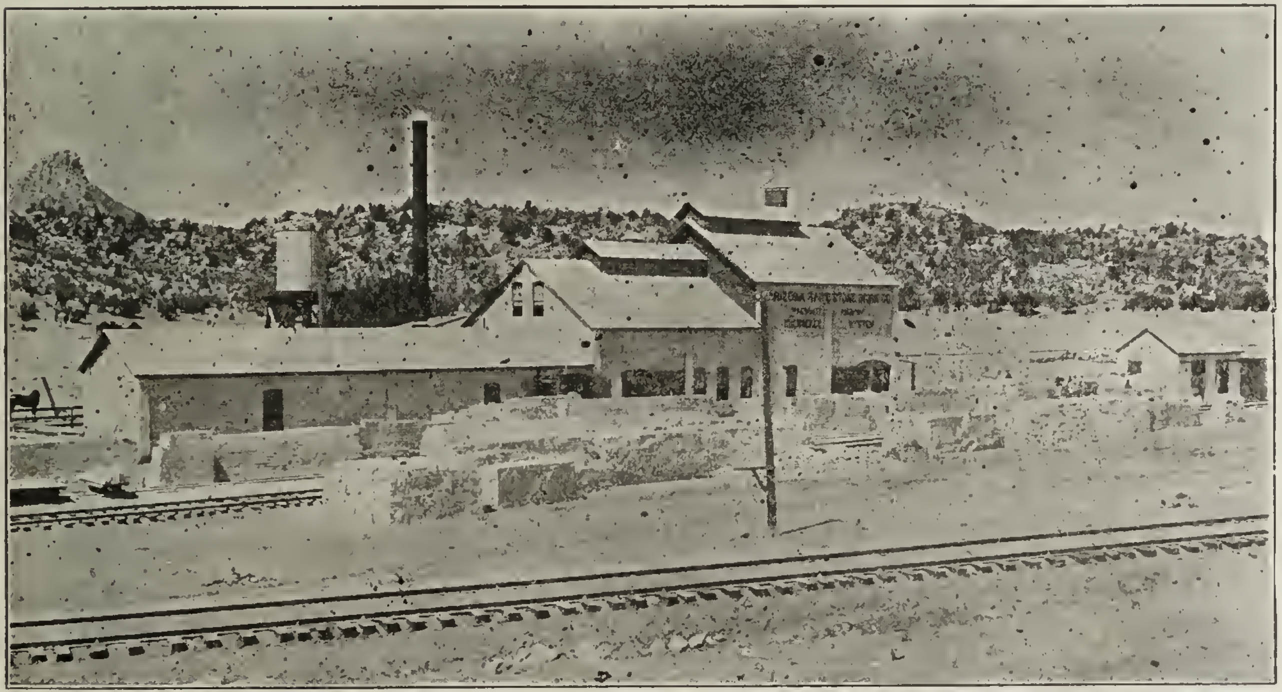

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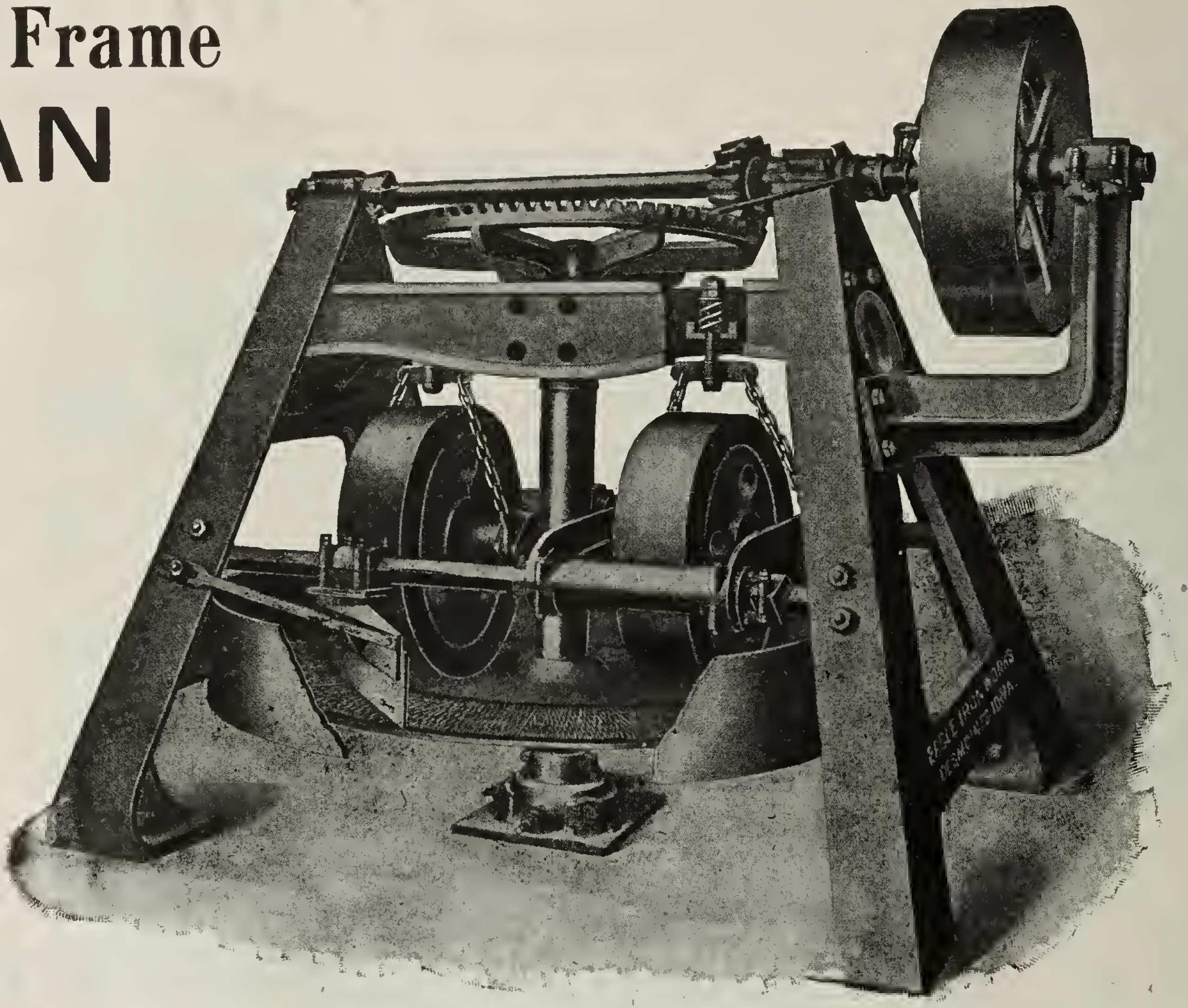

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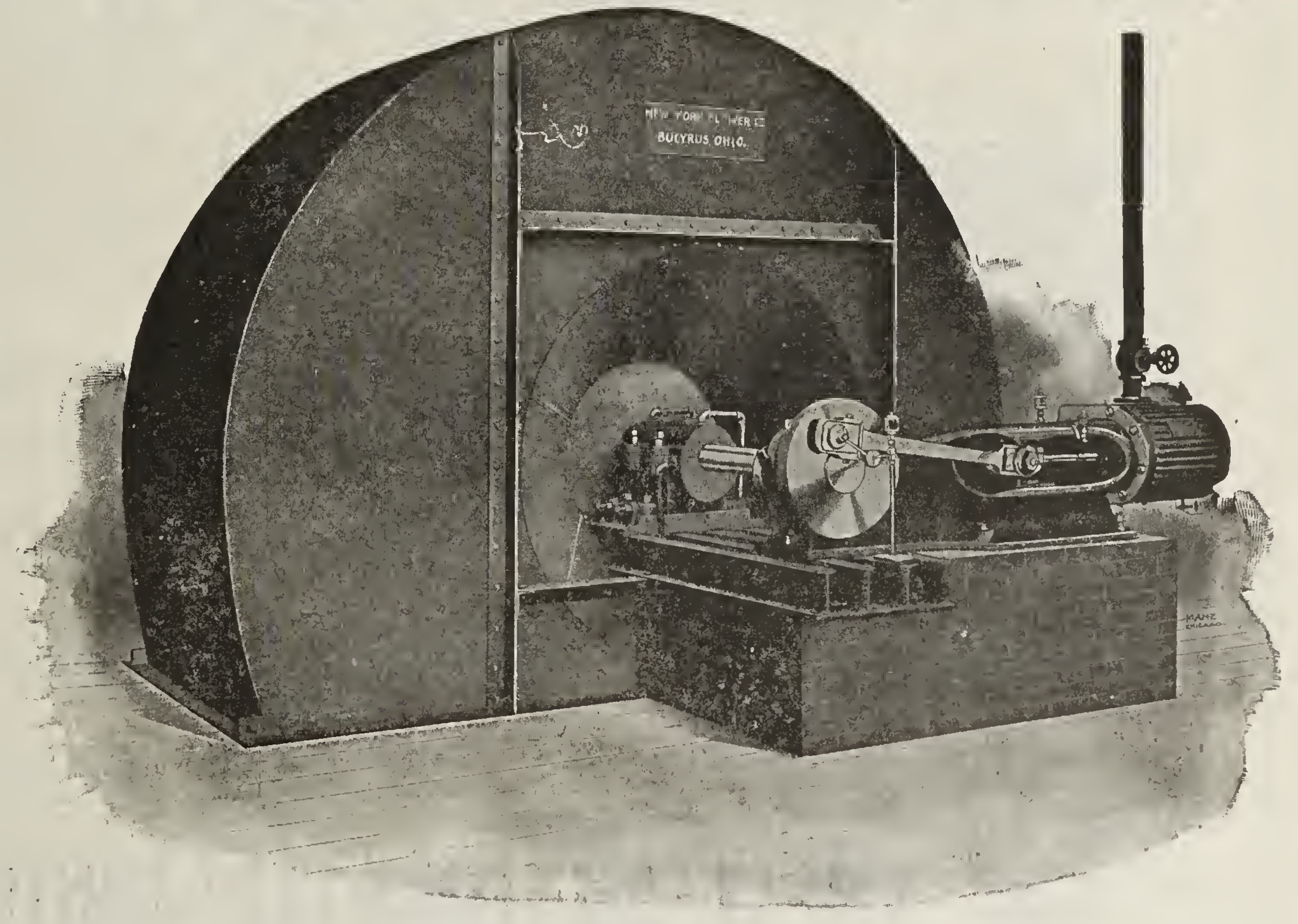

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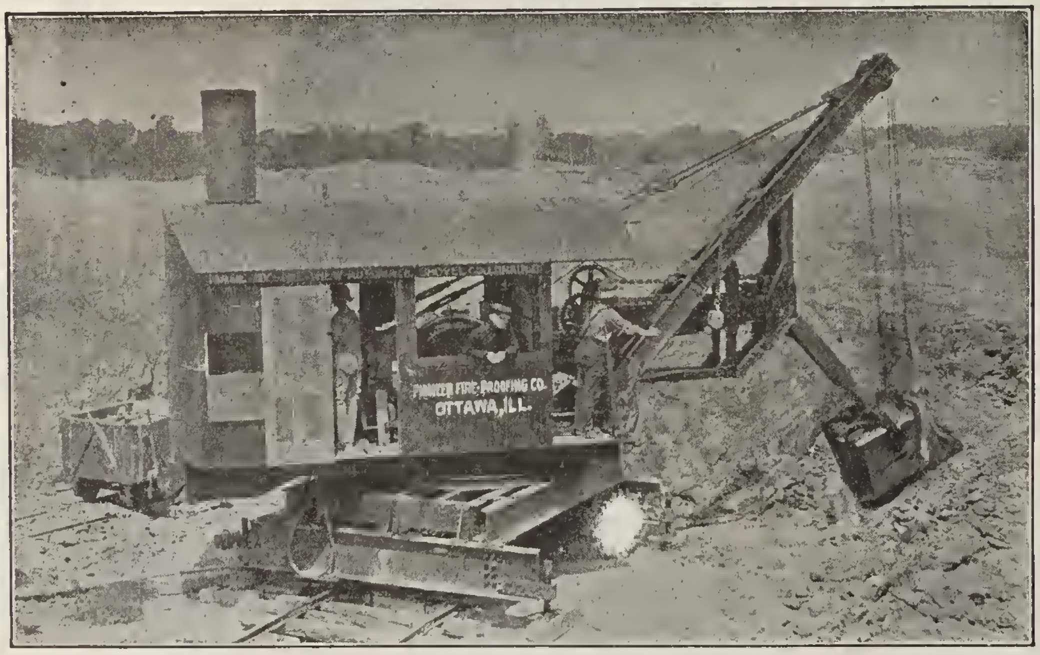

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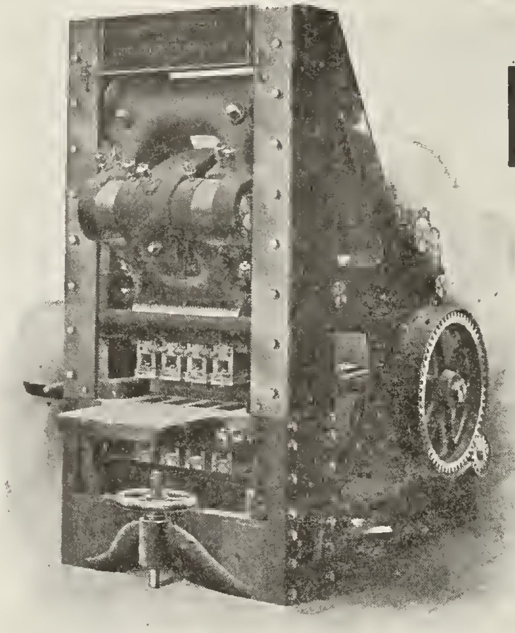

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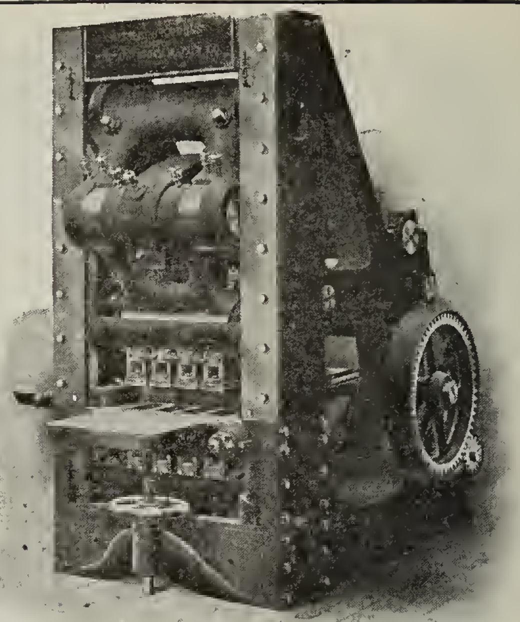

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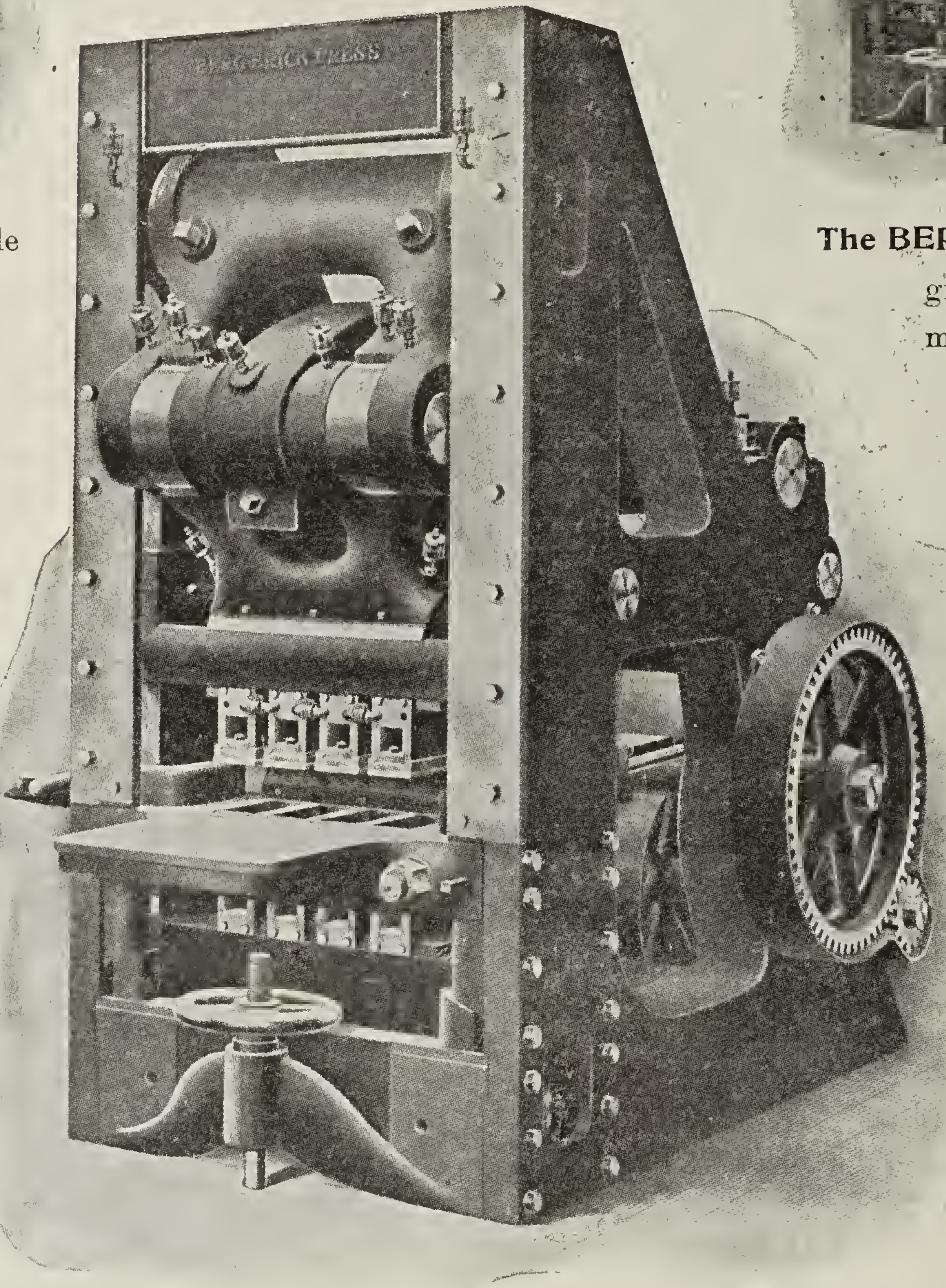

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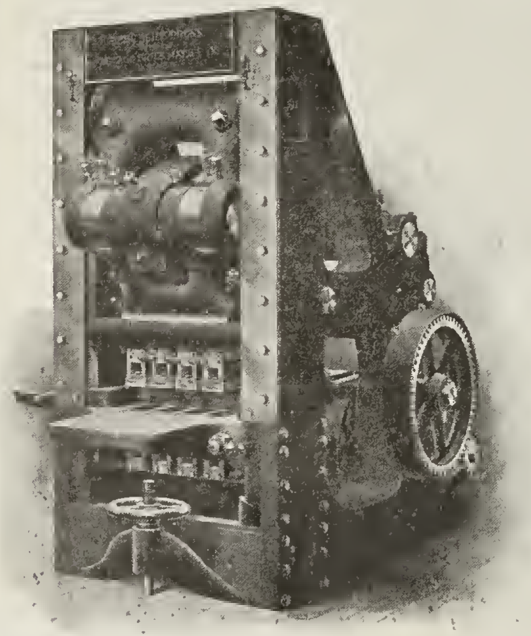

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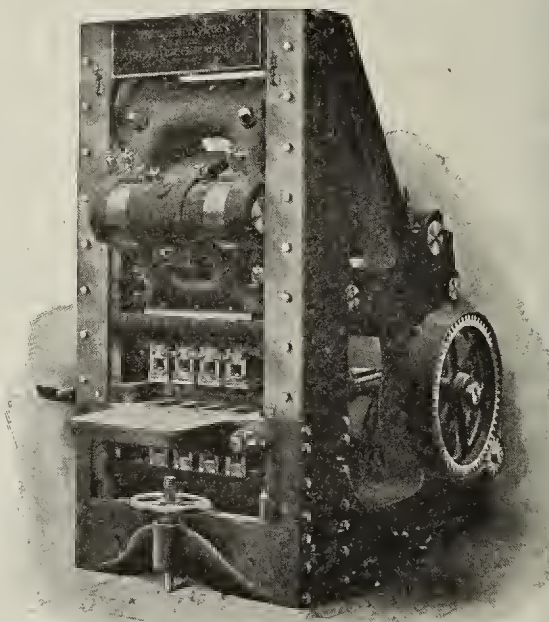

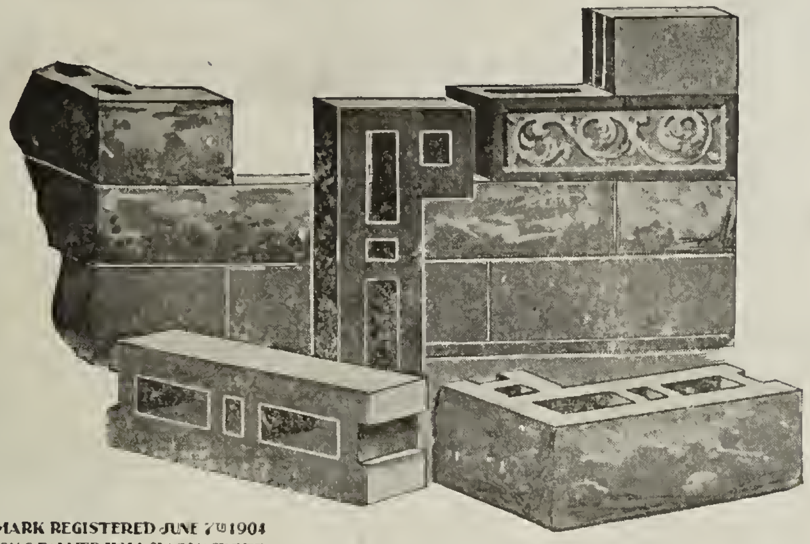

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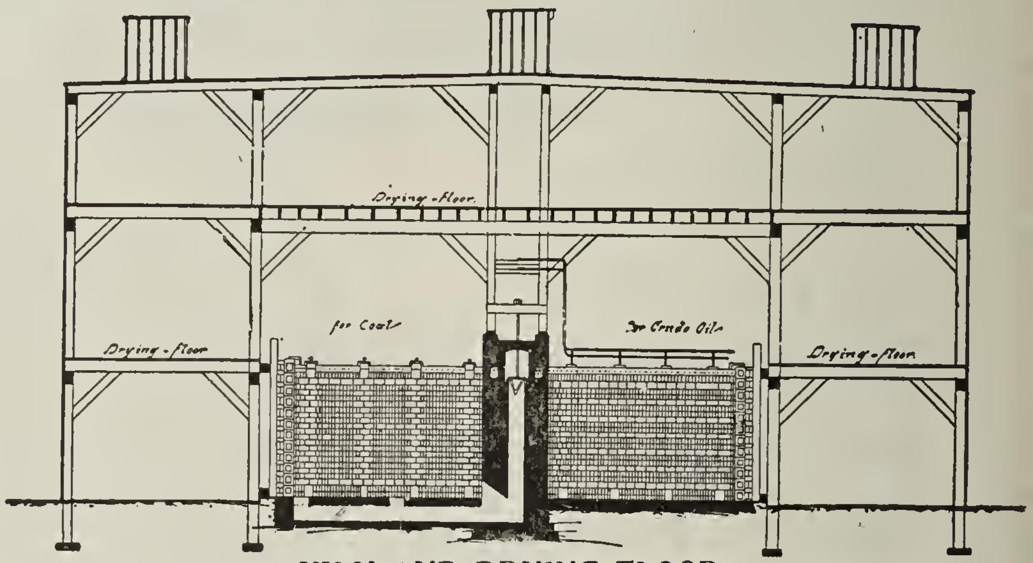

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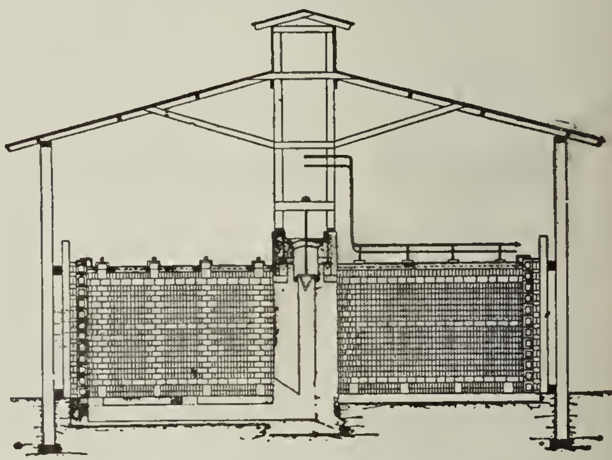
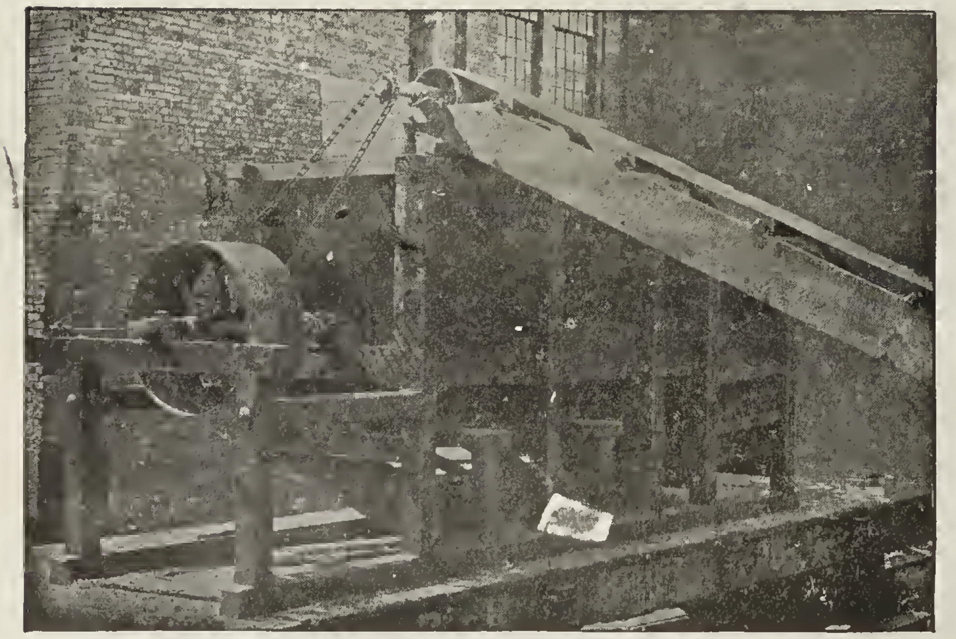
Lehmann Metal Lined, Self-Lubricating Die

Can be made and adapted to any kind of clay at the place of manufacture, and insures uniformity of size of manufactured goods.



CONTINUOUS KILN



LEHMANN SLUMMING MACHINE

Lehmann Slumming Machine

MOST PRACTICAL, SIMPLE AND EFFECTIVE

The slumming process is the most economical and the only reliable method for removing gravel and other foreign matter from Common Clay, Kaolin, Chalk, Mineral Paints, etc.

ALL THESE DEVICES HAVE BEEN TRIED THOROUGHLY AND SUCCESSFULLY.

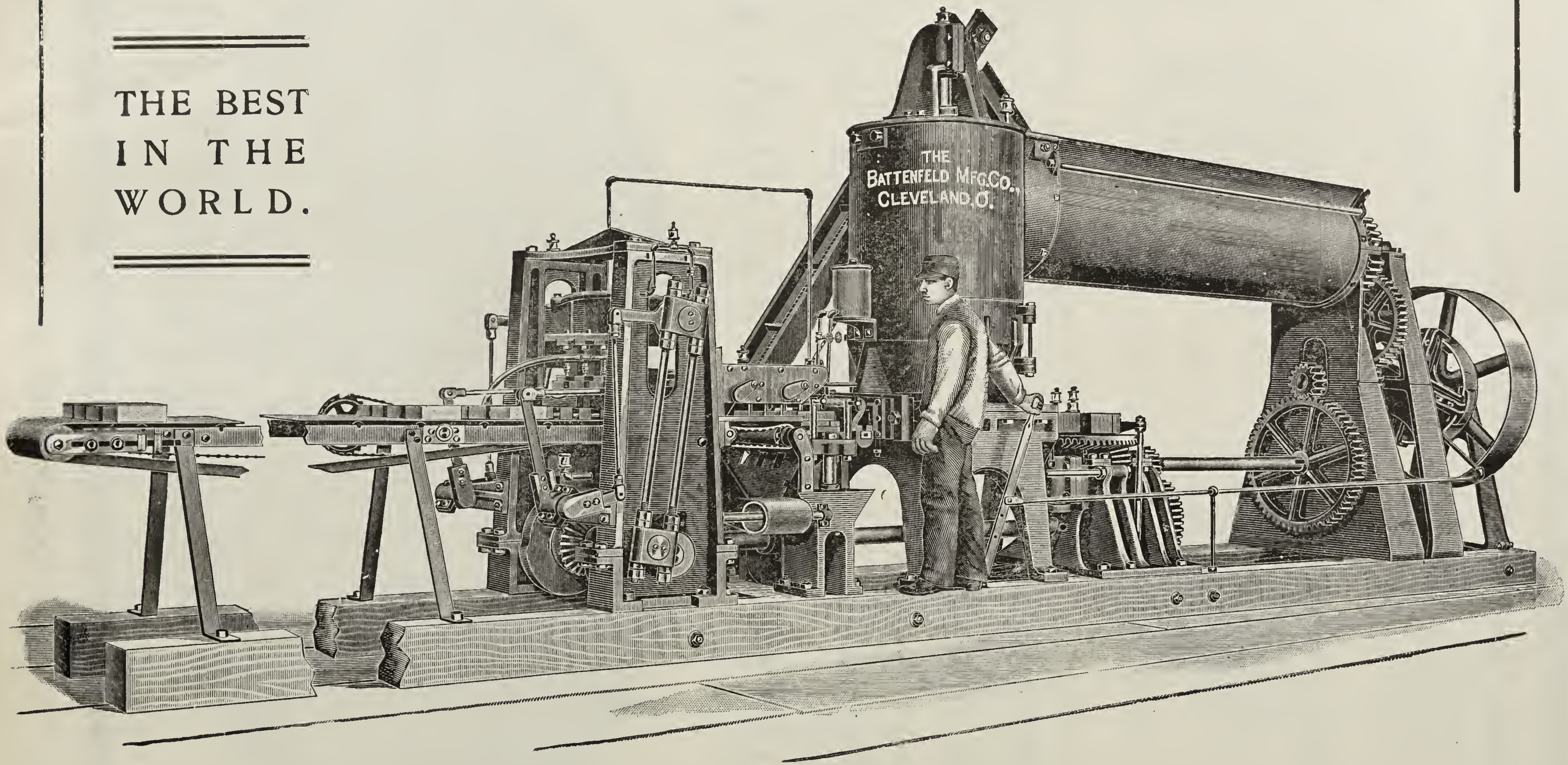
Will plan and construct any system of Kiln...Up-Draft, Down-Draft, Muffle or Tunnel. Plans and estimates furnished for Brick and Tile, Lime and Cement Work. Practical tests made.

F. LEHMANN COMPANY

Consulting Clay-Worker Engineers,
163 Rhine Street, Chicago, Ill.

THE DICTATOR BRICK MACHINE

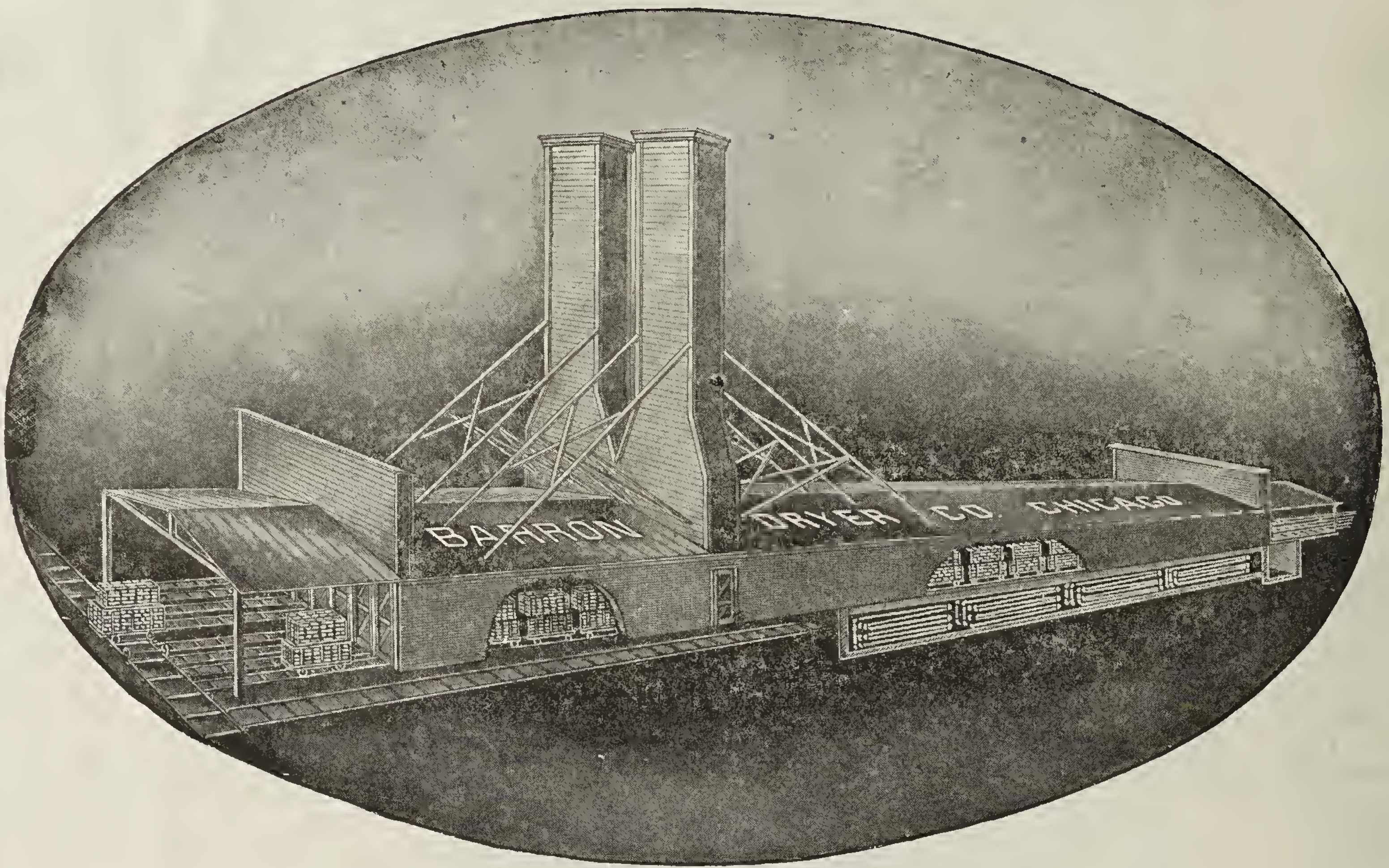
THE BEST
IN THE
WORLD.



THE BATTENFELD MFG. CO.

WRITE FOR CATALOGUE.

CLEVELAND, OHIO.



If You Are Progressive

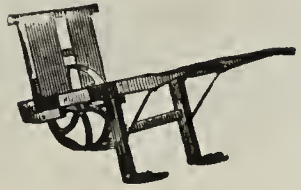
You know that the brickmakers who are making the money in these days are those who have installed an up-to-date drying system enabling them to cope with ease with the heaviest demands of the market, their operations being uninterrupted all the year round.

This is true of them, what of your case? Why adhere still to antiquated methods subjected to weather limitations. Determine to install the most effective drying system in existence and apply for information and quotations to the

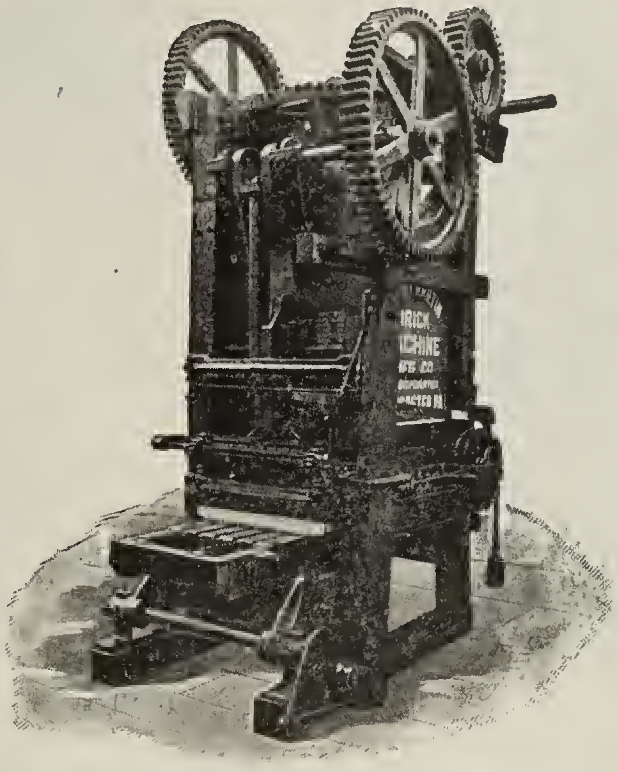
BARRON DRYER COMPANY

Temple Court Building, 225 Dearborn Street, CHICAGO, ILL.

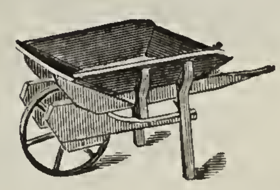
THE BEST IS THE CHEAPEST
IN THE END

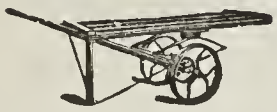


The Machine
that
"makes good"
Brick



"Best by Test"
Martin
Machinery





Martin's Style "A."

Have you a copy of our 1905 catalogue? Better consult it before you buy elsewhere.

Our Engineering Department is ever at your service. Consult our experts on brick yard troubles.

SOFT MUD PLANTS

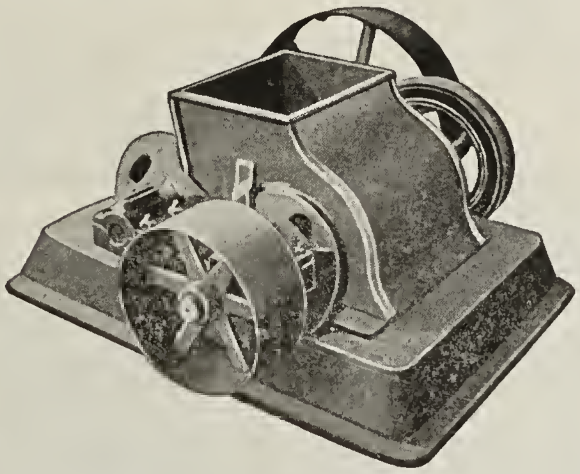
AUGER MACHINERY

MARTIN

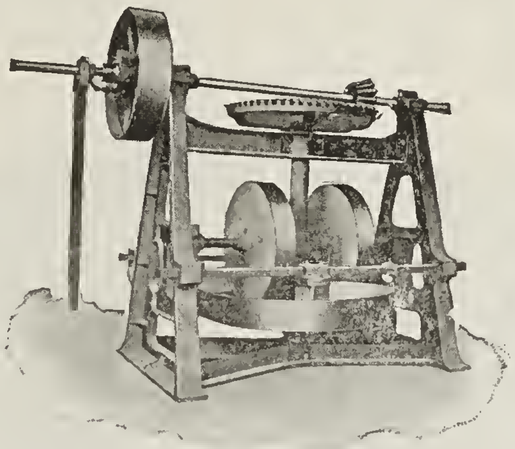
ROCK CRUSHING PLANTS

ELEVATORS AND CONVEYORS

IN STEAM DRYING there is no system as simple as the MARTIN, or that will give more satisfactory results, and at as low a cost for continual operation. Will **positively** dry the brick over night. No cars, fans, blowers, trucks or engines. Let us talk the matter over with you.



DISINTEGRATORS.



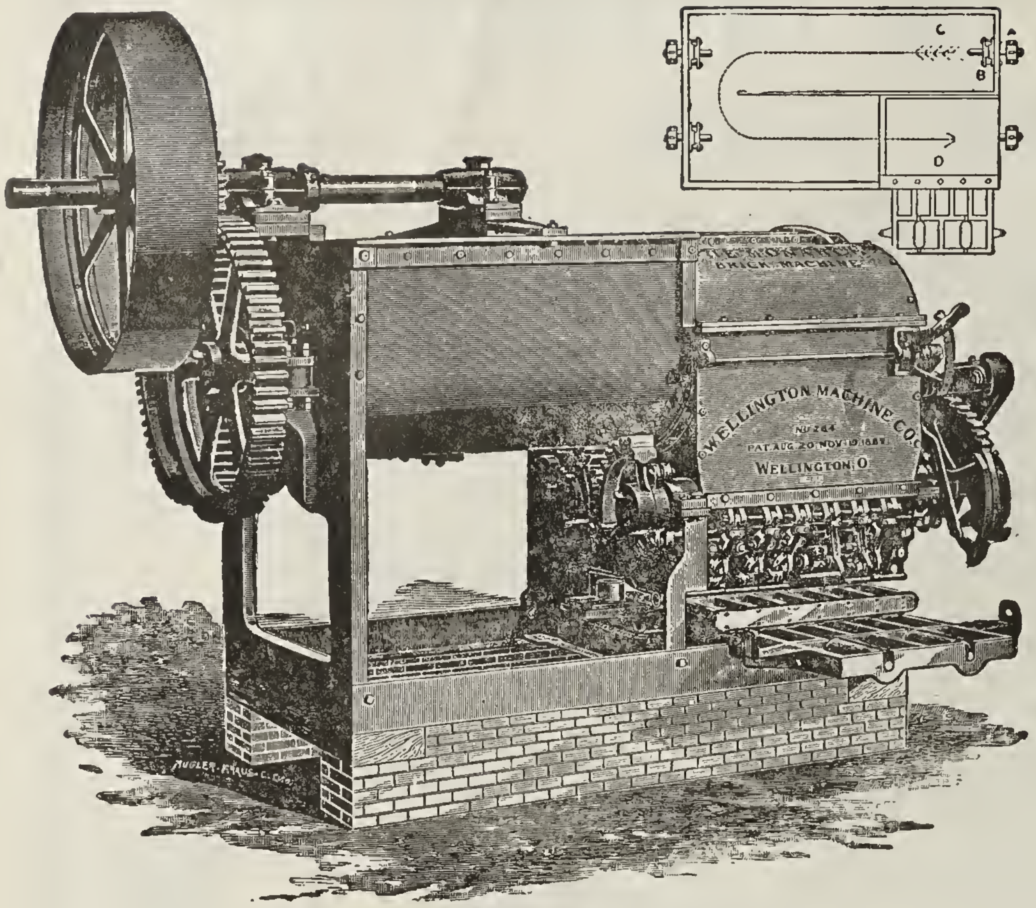
DRY AND WET PANS.

WE FURNISH EVERYTHING A BRICKMAKER NEEDS.

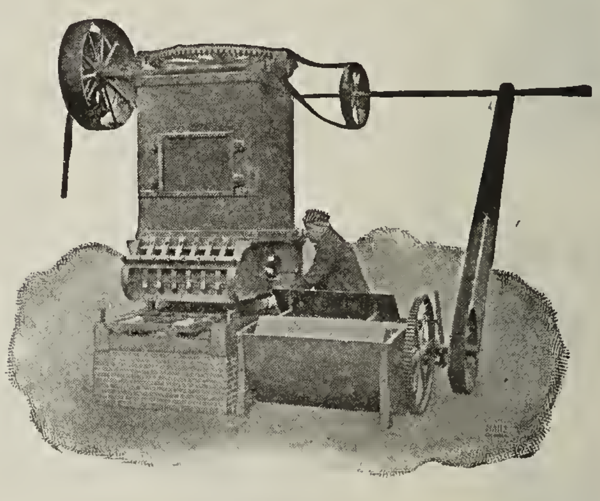
THE HENRY MARTIN BRICK MACHINE MFG. CO.

LANCASTER, PA., U. S. A.

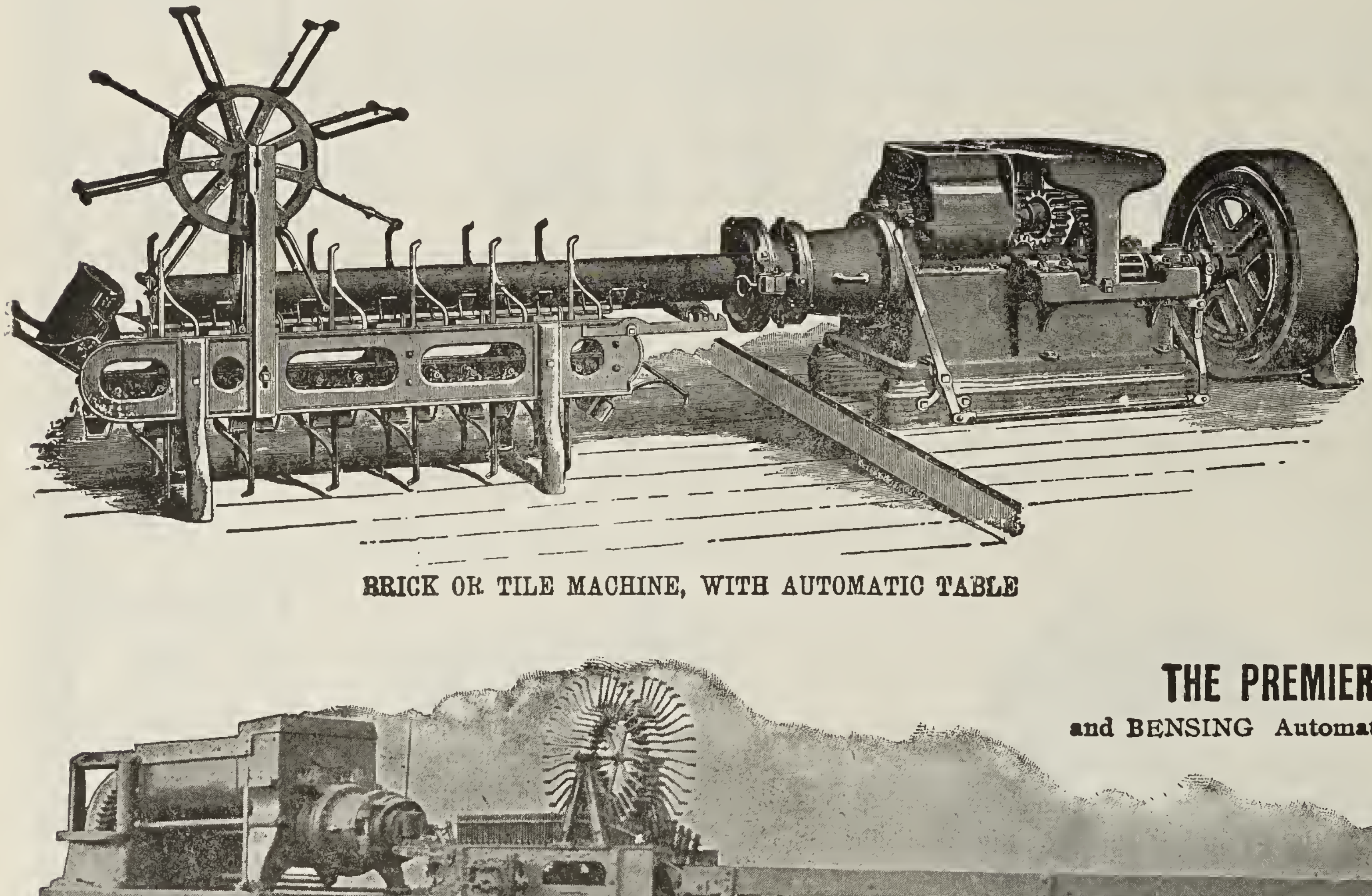
BRICK and TILE MACHINERY



MONARCH STOCK BRICK MACHINE
Capacity, from 30,000 to 50,000



THE QUAKER
Horse or Steam Power. Capacity, 20,00 to 35,000

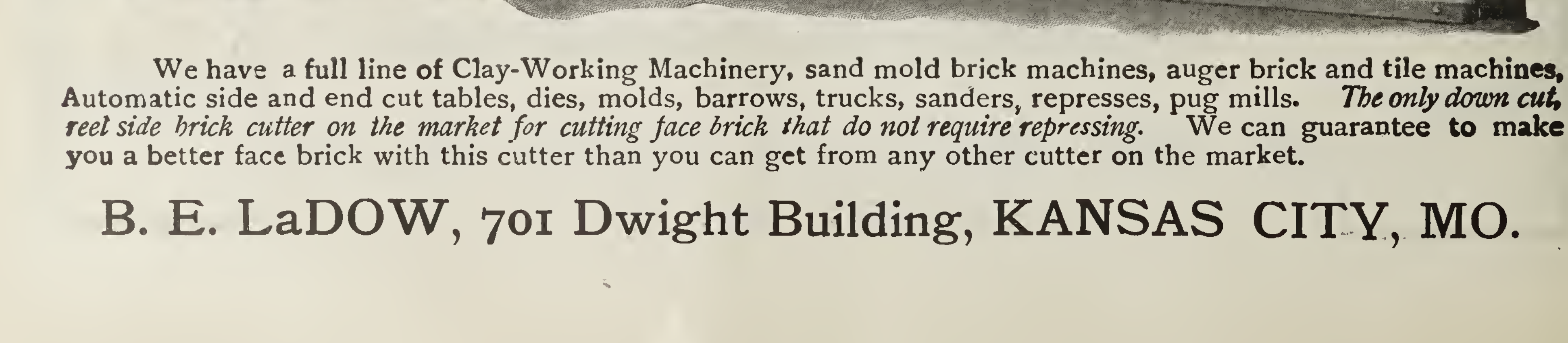


BRICK OR TILE MACHINE, WITH AUTOMATIC TABLE

"We Fulfill our Guarantees."

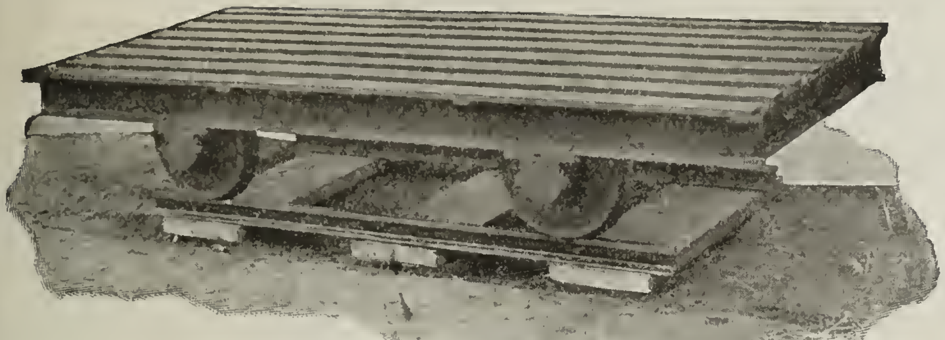
THE PREMIER BRICK MACHINE

and BENSING Automatic Side Cut BRICK CUTTER.

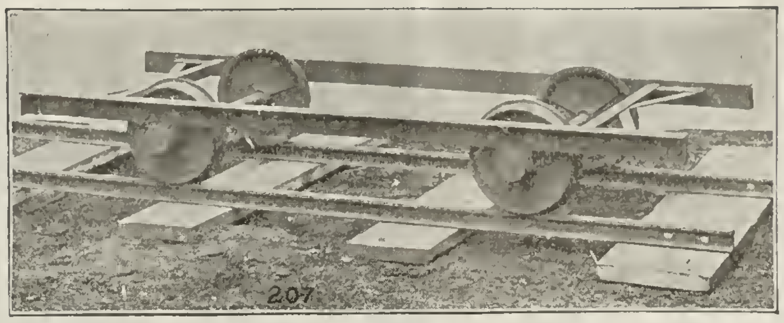


We have a full line of Clay-Working Machinery, sand mold brick machines, auger brick and tile machines, Automatic side and end cut tables, dies, molds, barrows, trucks, sanders, represses, pug mills. *The only down cut, reel side brick cutter on the market for cutting face brick that do not require repressing.* We can guarantee to make you a better face brick with this cutter than you can get from any other cutter on the market.

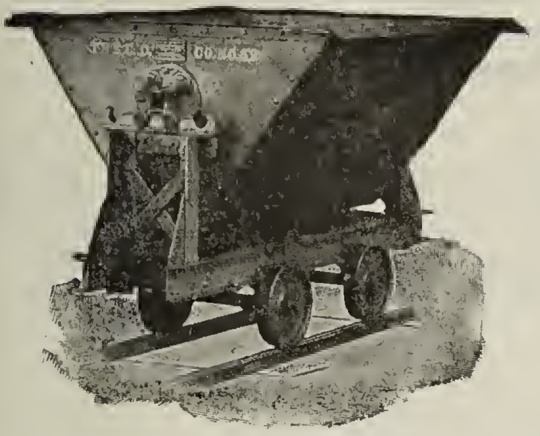
B. E. LaDOW, 701 Dwight Building, KANSAS CITY, MO.



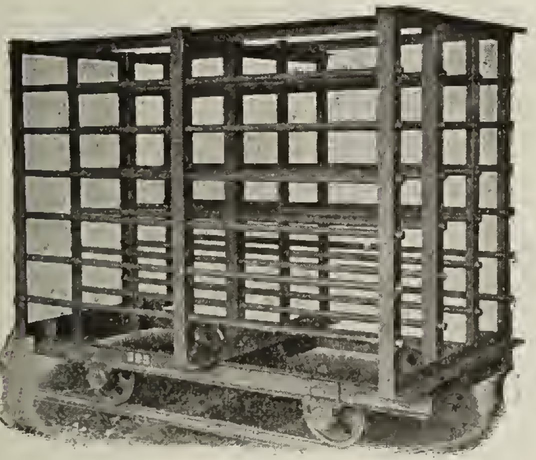
No. 212.
STEEL DECK CAR, CHANNEL FRAME.
For Drying Brick, Sewer Pipe, Etc.



No. 207.
FLAT CAR, WOODEN DECK.
For Brick, Tile, Etc.



No. 52.
TRUNION DUMP CAR.
For Handling Coal, Sand, Ashes, Etc.



No. 523.
RACK CAR, HEAVY TYPE.
For Use With Coke Oven, Furnace and Cupola Block.

The Cleveland Car Company

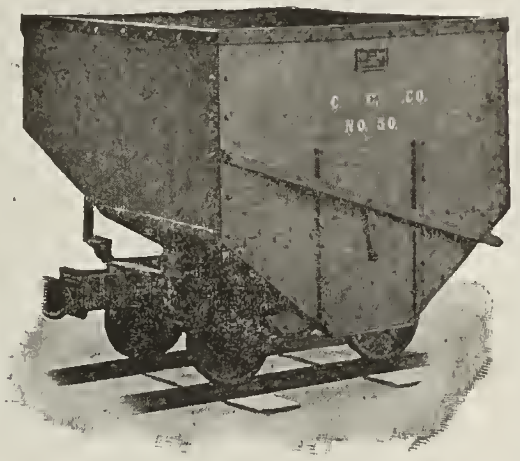
West Park -:- Ohio

Designers and Builders of

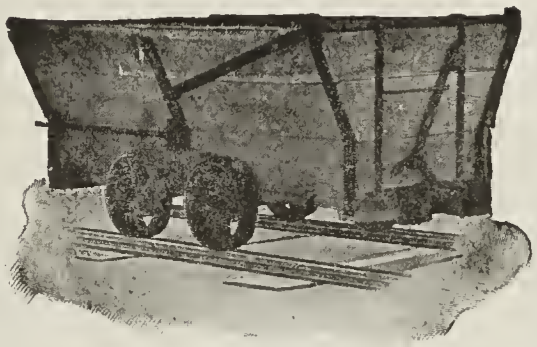
Complete Equipment for Narrow Guage Railroads

Dryer Cars of Every Description, Dump Cars, Turn Tables, Transfer Cars, Switches, Frogs, Rails, Etc.

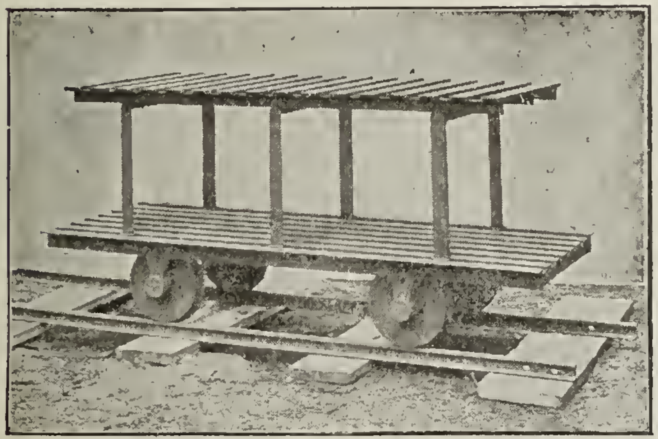
Overhead Trolleys, Kiln Doors, Furnace Fronts, Grate Bars and Brick Barrows : : : :



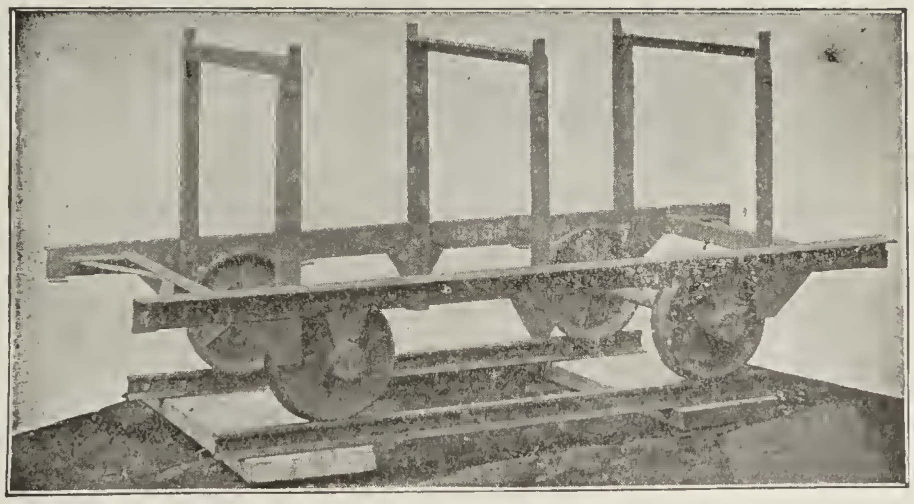
No. 50.
ONE SIDE DUMP CAR.
For Dumping Into Dry Pans, Disintegrators and Crushers.



No. 31.
END DUMP CAR.
Adapted to Handling Coal, Shale, Sand, Etc.

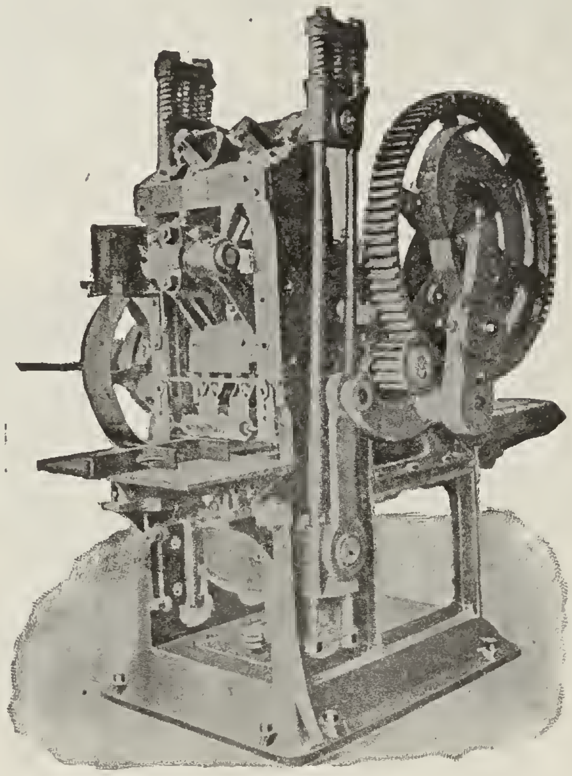


No. 244.
DOUBLE DECK CAR, STEEL DECKS.
For Brick, Tile, Fire-Proofing, Etc.



No. 245A.
DOUBLE DECK CAR, WOODEN DECK.
For Brick and Other Clay Products.

THE RICHARDSON REPRESS



Richardson Double Die Repress.

HAS NEVER BEEN REPLACED by one of another make.

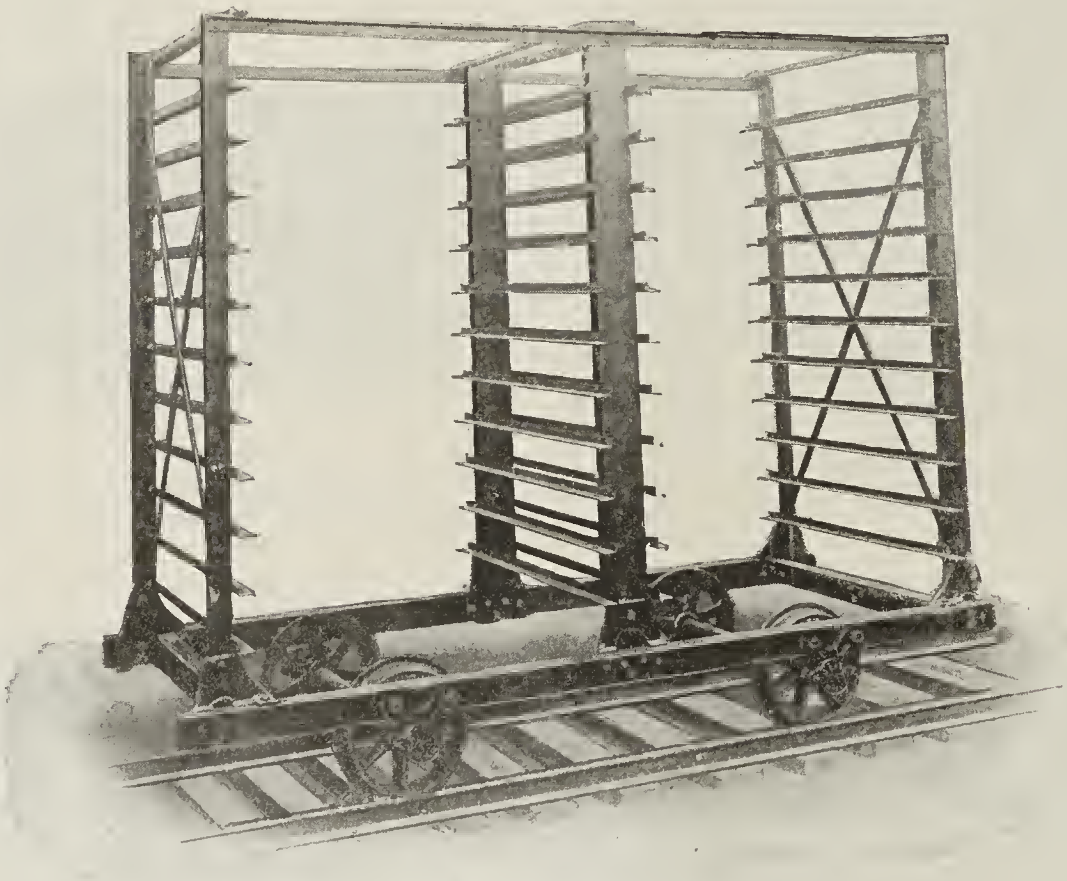
This is a fact that we think it not improper to boast of.

Do you not agree with us and is this not the repress you want in your plant?

"We also have another boast coming." We never had any of our dryer cars rejected.

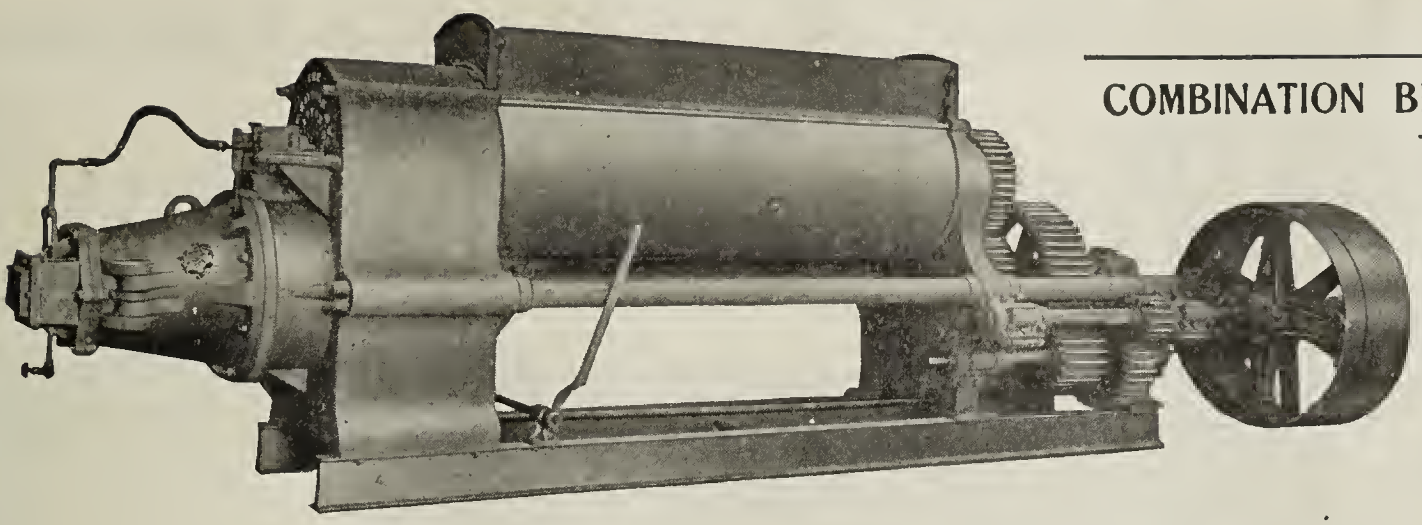
They are fit companions for our repress.

We are prepared to furnish you any machinery you want or will build your plant complete.



Soft Mud Rack Car.

The Ohio Ceramic Engineering Company
Cleveland, Ohio.

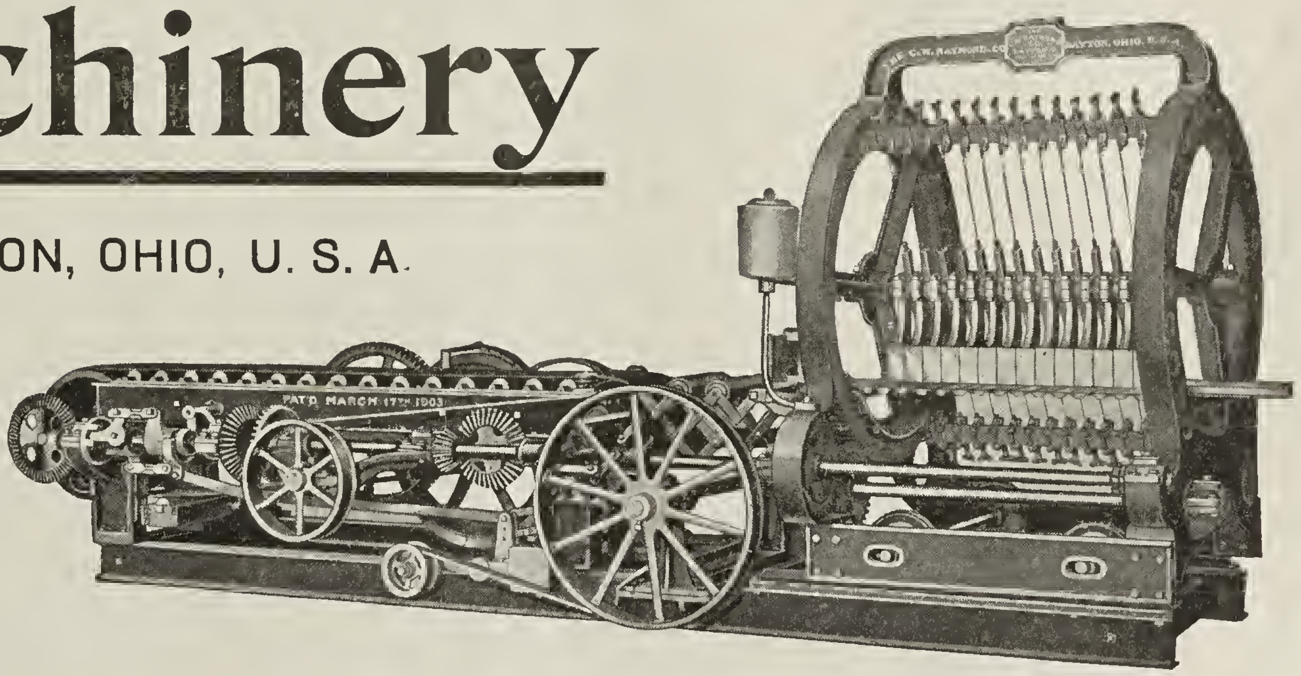


COMBINATION BRICK MACHINE

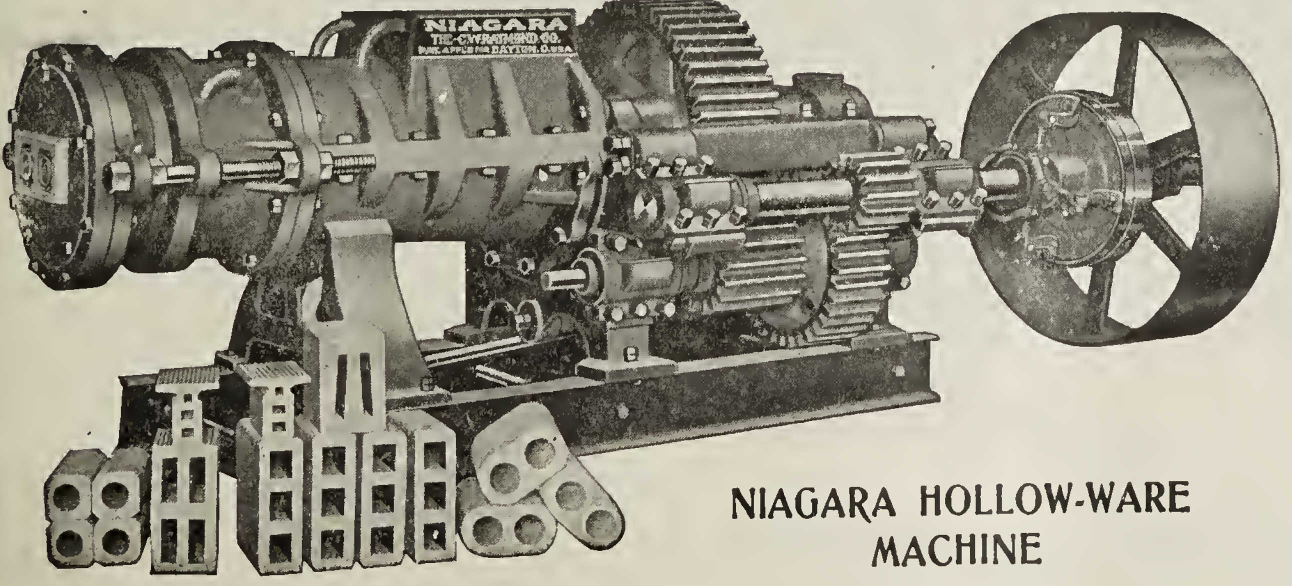
THE
C. W. RAYMOND CO
Clay-Working Machinery

DAYTON, OHIO, U. S. A.

NEW YORK
39—41 Cortlandt Street
ST. LOUIS
315 Frisco Building
PITTSBURG
1425 Park Building



AUTOMATIC DOWN-CUT CUTTER

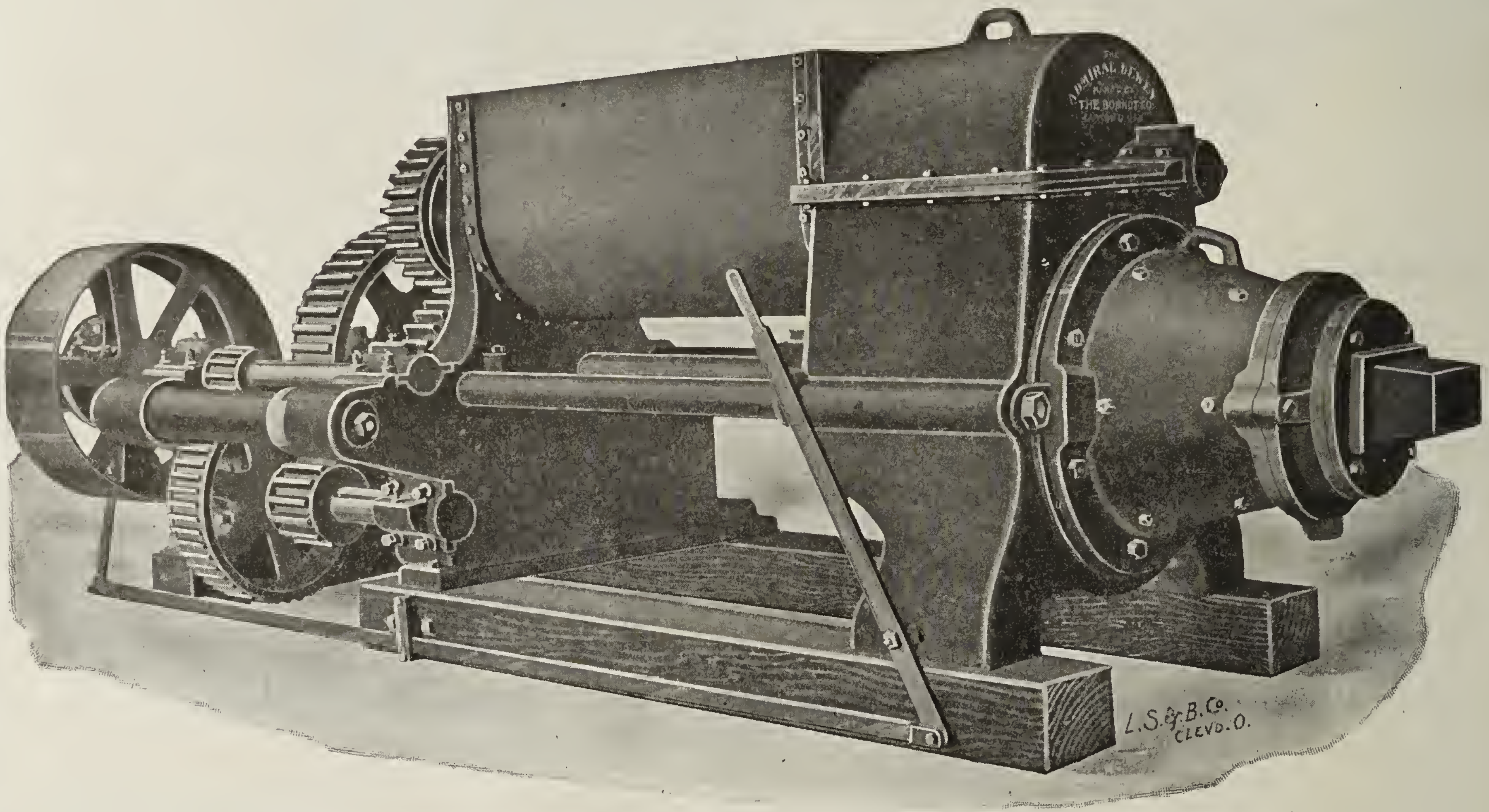


NIAGARA HOLLOW-WARE MACHINE

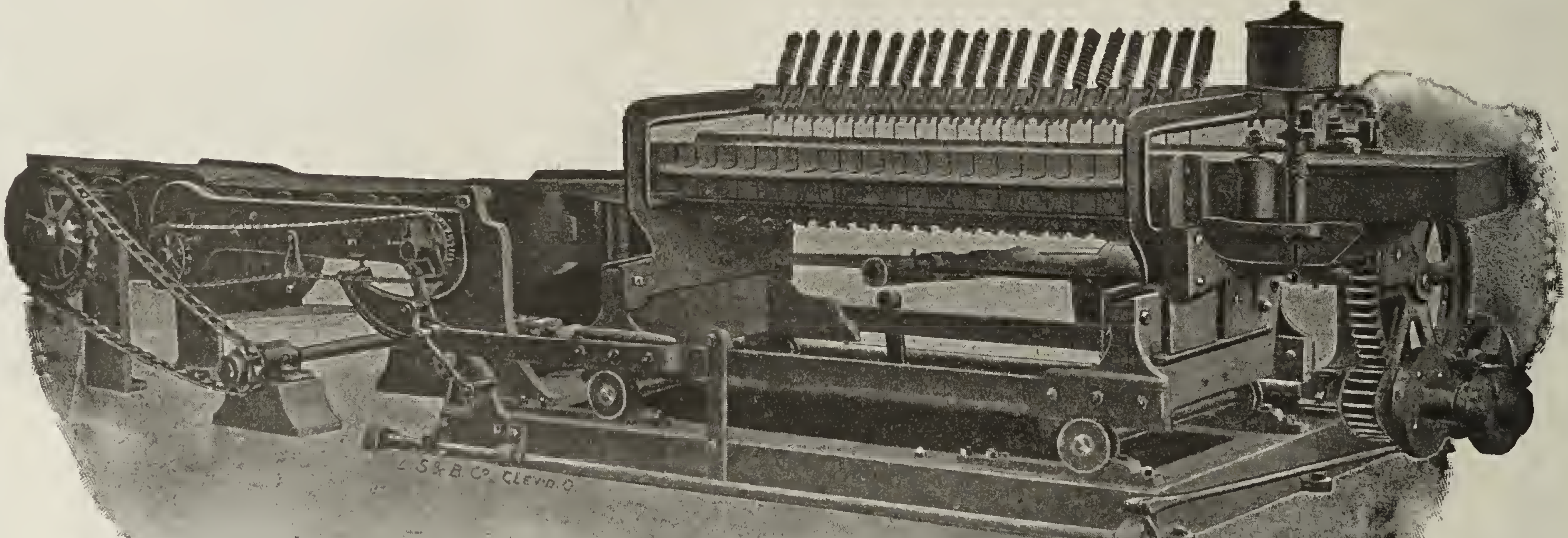
Raymond Machinery
Creates New
Business for the User
Better Brick
and more of them.

CATALOGUE

Modern Brick Machinery



SPECIAL COMBINED BRICK MACHINE AND PUG MILL 100,000 daily capacity.
AUGER BRICK MACHINES 10,000 to 100,000 capacity, five sizes.



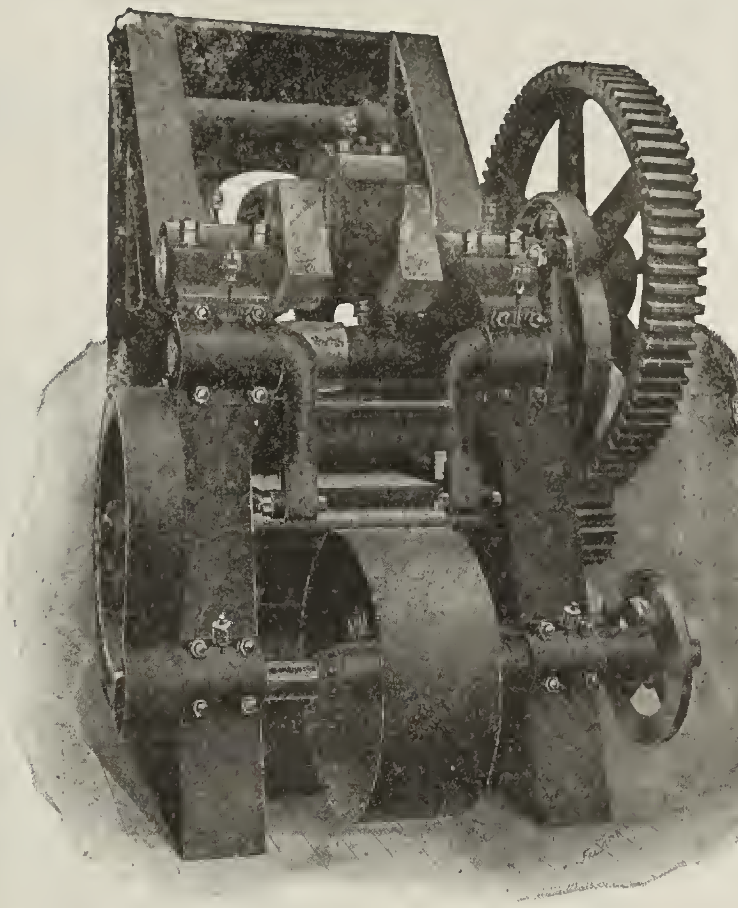
AUTOMATIC SIDE CUT TABLE. Simple, positive, durable.

COMPLETE EQUIPMENTS FOR BRICKMAKERS. *ASK FOR CATALOGUE.*

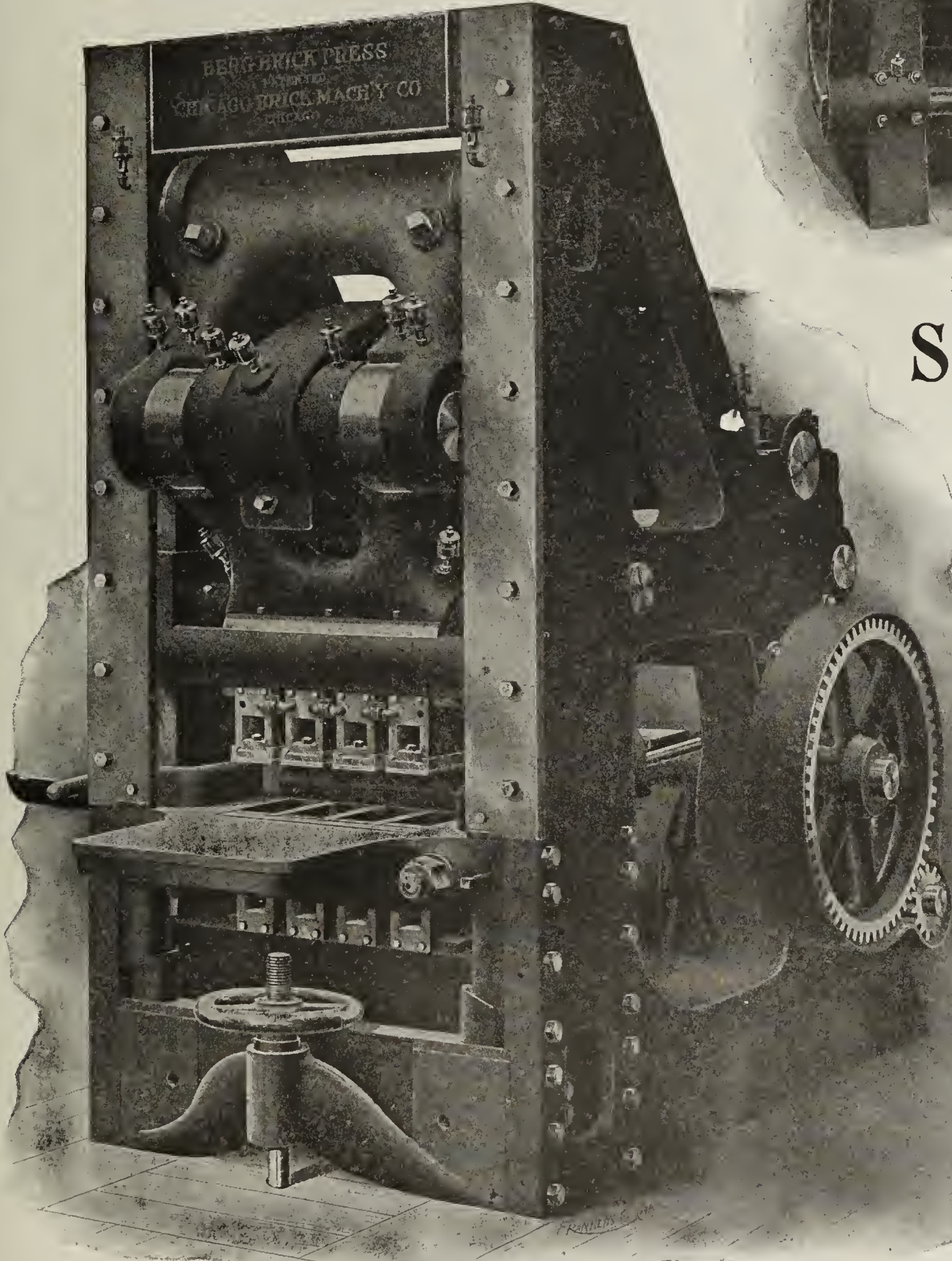
THE BONNOT COMPANY, Canton, Ohio.

—WESTERN AGENTS—
CHICAGO BRICK MACHINERY CO., - - - 77 Jackson Boulevard, Chicago, Ill.

NEW MODEL BERG BRICK PRESS



Back View.



Still in the Lead

AND

One Step Further Forward

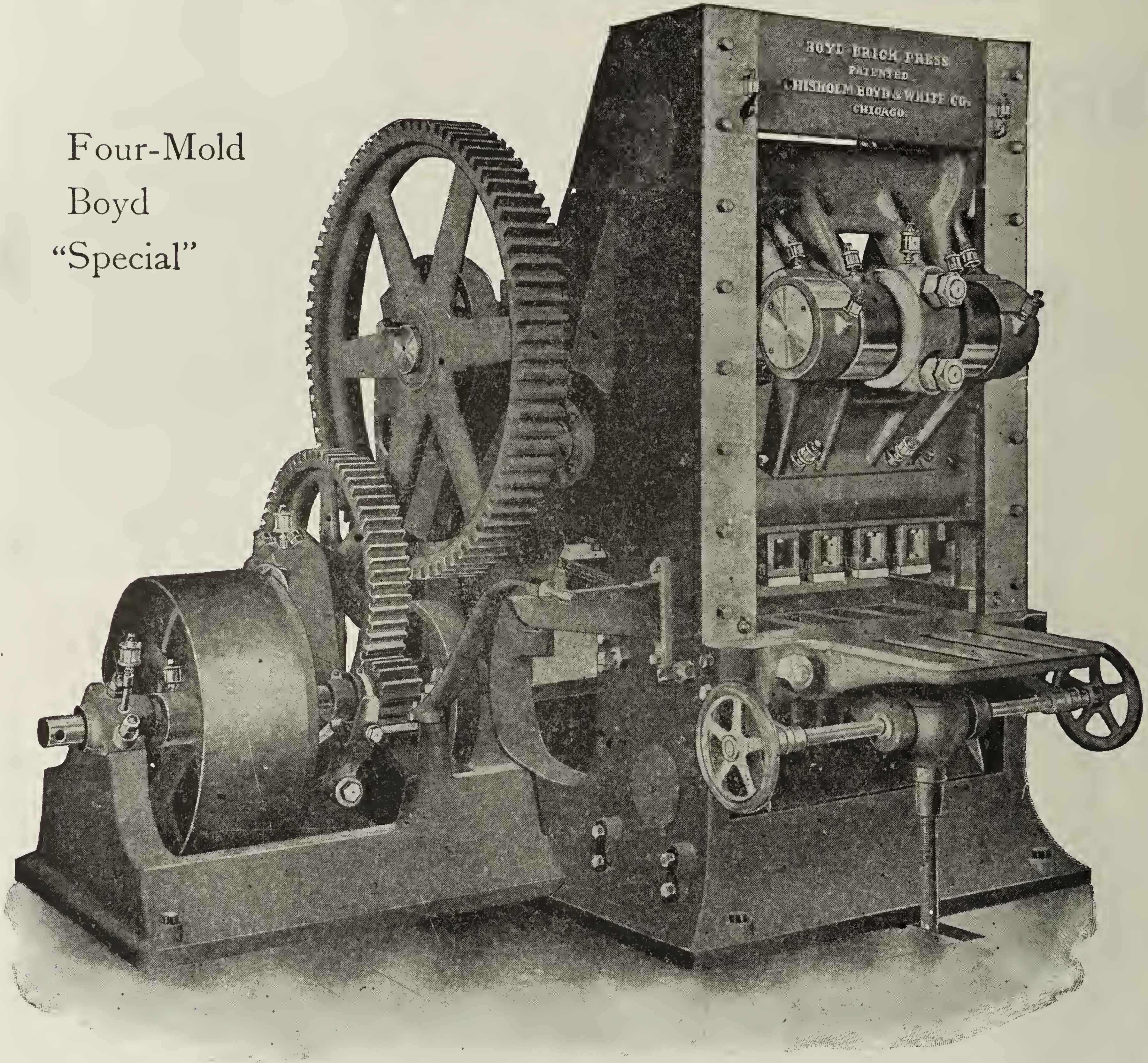
Even stronger than ever and all self-contained. Greater pressure and fewer working parts than any other machine. Simple, massive, compact. Running mechanism placed in rear, as shown in upper cut, enabling this machine to be SHIPPED IN ONE PIECE.

MANUFACTURED BY
ANDERSON FOUNDRY & MACHINE WORKS
Anderson, Indiana.

SOLD BY
CHICAGO BRICK MACHINERY COMPANY
77 Jackson Boulevard, Chicago.

The Boyd Brick Press

Four-Mold
Boyd
"Special"



A Business Proposition.

We will send to any responsible party a **BOYD BRICK PRESS ON TRIAL** and subject to purchase after the making and burning of one or more kilns of brick. We take the machine back if not satisfactory.

THE BOYD BRICK PRESS exerts greater pressure, holds it longer, puts more clay into brick, and makes stronger brick than any other Brick Press made. Especially adapted for working shales, and is the only successful machine for making fire brick.

ALL BOYD PRESSES are fitted with our IMPROVED PATENTED MOLD BOX, the liners of which are made of the hardest and toughest known metal, which can be reground at low cost when worn. The molds can be changed in a few minutes.

ITS RECORD: More Boyd Presses in actual operation than of all other Press Brick Machines combined. Write for General Catalogue No. 10.

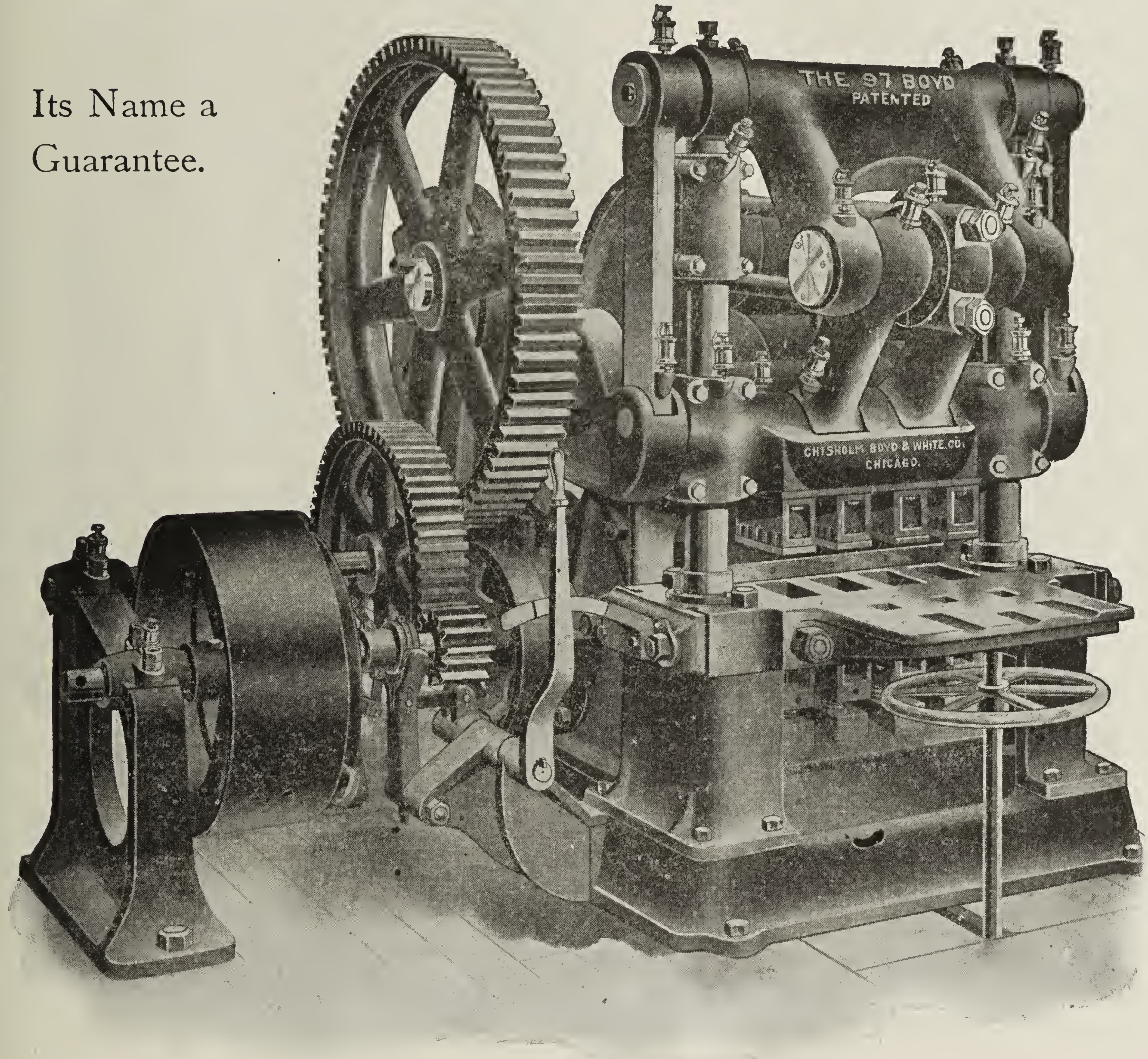
Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

The Boyd Brick Press

The '97 Model

Its Name a
Guarantee.



THE '97 MODEL BOYD BRICK PRESS has enormous strength and great durability; it is compact; the adjustments are convenient; it operates quietly and smoothly; the workmanship and material are of the best; the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking.

THE BOYD is the only Brick Press provided with an independent adjusting device for regulating the amount of clay in the molds and the pressure on the brick. This feature positively ensures equal pressure and finish on both sides of the brick, and no granulated or soft centers.

Sent on trial and fully guaranteed. Seventy presses of this pattern now in use. Cannot be broken in pressing brick. Write for descriptive catalogue No. 9.

Chisholm, Boyd & White Company

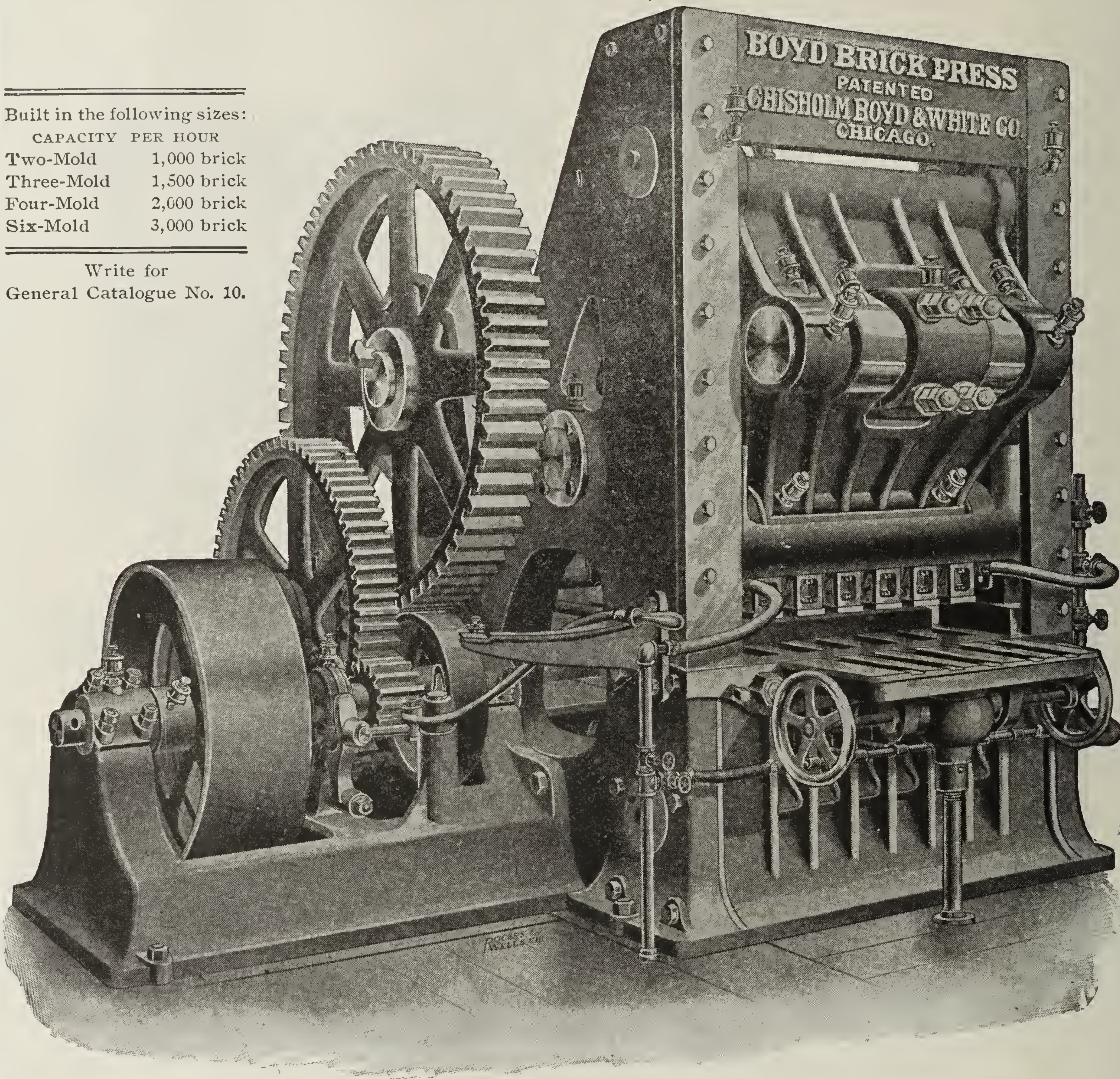
Office and Works, 57th and Wallace Sts. **CHICAGO, ILL.**

The Boyd Brick Press

Built in the following sizes:

	CAPACITY PER HOUR
Two-Mold	1,000 brick
Three-Mold	1,500 brick
Four-Mold	2,000 brick
Six-Mold	3,000 brick

Write for
General Catalogue No. 10.



Another Record for the Boyd Press:

Six of our SIX-MOLD PRESSES in use on ONE YARD since 1892. Average cost of repairs for each machine One Dollar per year.

THE BOYD PRESS has always been distinguished for originality in design and construction. It will make better brick from clay or shale than can be made from the same material by any other press. It is selected and purchased by the most progressive Brick Makers. The largest and most successful brick plants in the country are using Boyd Presses.

Chisholm, Boyd & White Company

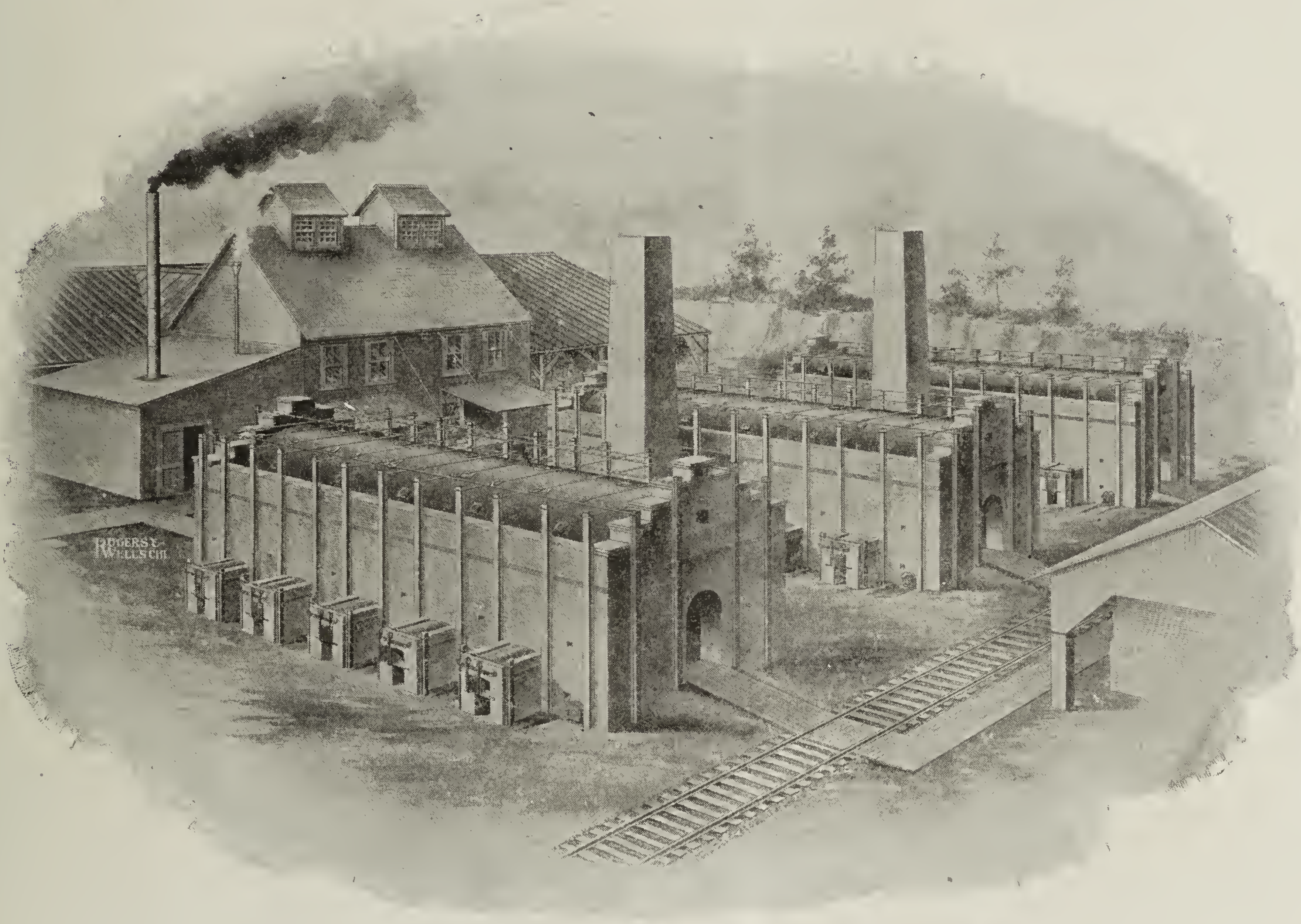
Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

Chisholm, Boyd & White Company

Engineers and Contractors for Brick Plants.

MANUFACTURERS OF

The Boyd Brick Press


ROGERS & WELLS CHI.

A MODERN BRICK PLANT—As Equipped by us.

A Sure Thing—We design, construct and equip Brick Plants of any desired capacity, furnishing the brickmaking machinery and power plant, erect the necessary buildings and kilns, and turn the plant over to the purchaser in proper working order, under guarantee of satisfactory results.

Brick Plants designed and equipped by us have the highest reputation for efficiency. They are modern, up-to-date, compact, convenient in arrangement, and are not encumbered with unnecessary or useless machinery or appliances.

CORRESPONDENCE SOLICITED.

Chisholm, Boyd & White Company

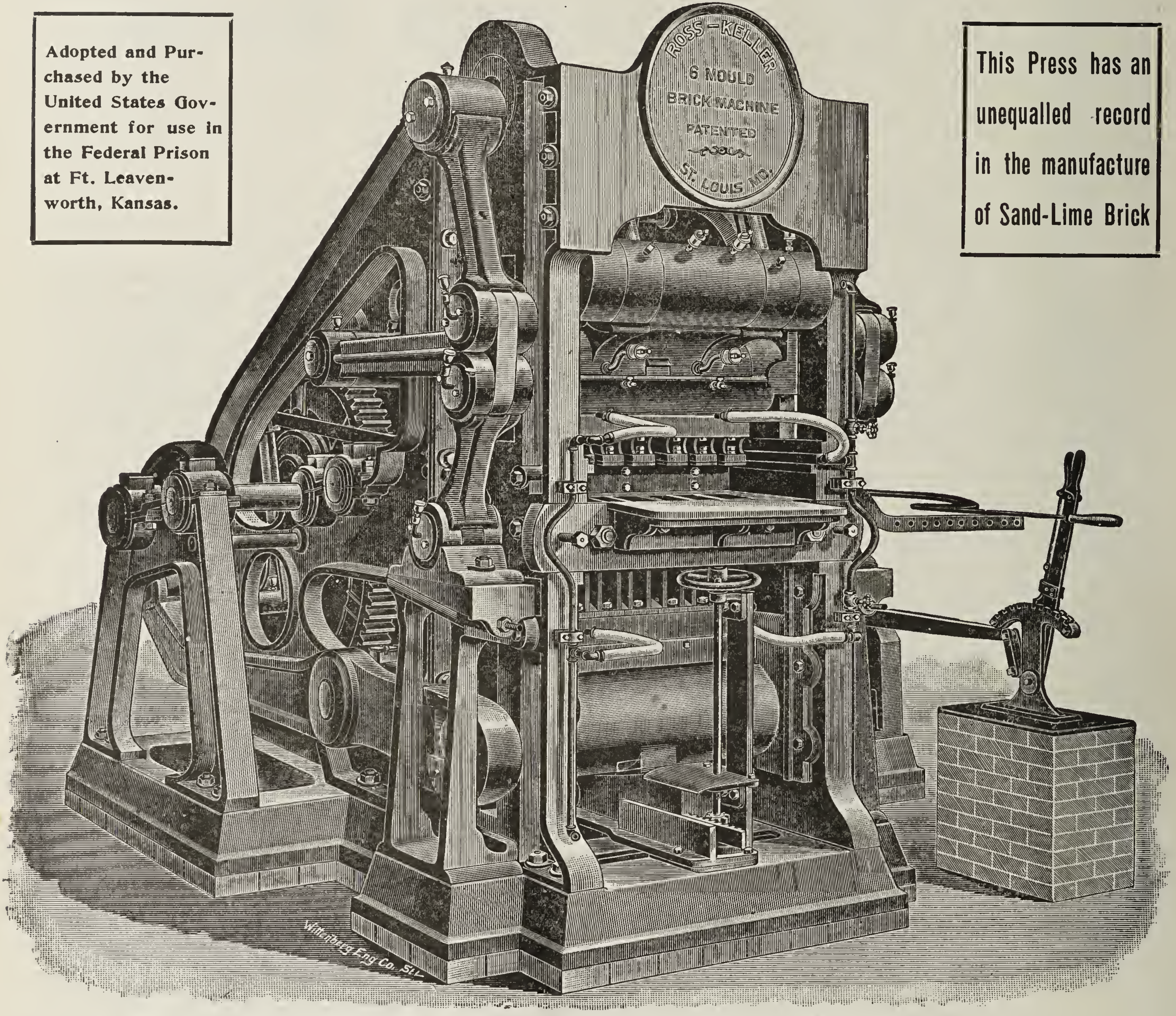
Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

BRICKMAKERS! We wish you a HAPPY NEW YEAR!

Would you increase your profits? Then let us tell you how to improve your Brick! Let us tell you about the Ross-Keller Press! The Press that leads all others!!

Adopted and Purchased by the United States Government for use in the Federal Prison at Ft. Leavenworth, Kansas.

This Press has an unequalled record in the manufacture of Sand-Lime Brick



ROSS-KELLER TRIPLE PRESSURE BRICK MACHINE.

BUILT IN TWO SIZES.

4 mould press has daily capacity of 20,000 to 24,000 brick.
6 mould press has daily capacity of 30,000 to 36,000 brick.

Ross-Keller Triple Pressure Brick Machine Co.

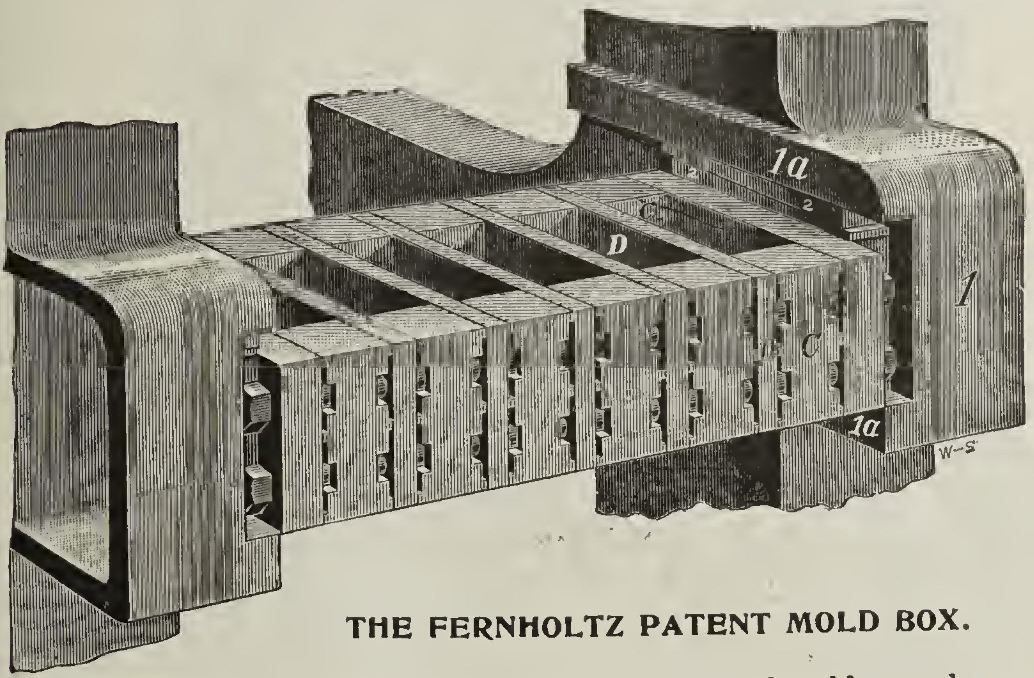
Fullerton Building, ST. LOUIS, MO., U. S. A.

The Fernholtz Brick Machinery Co.

Manufacturers of

The Celebrated Fernholtz Dry Press

Four mold Press 20,000 daily capacity. Six mold Press 30,000 daily capacity



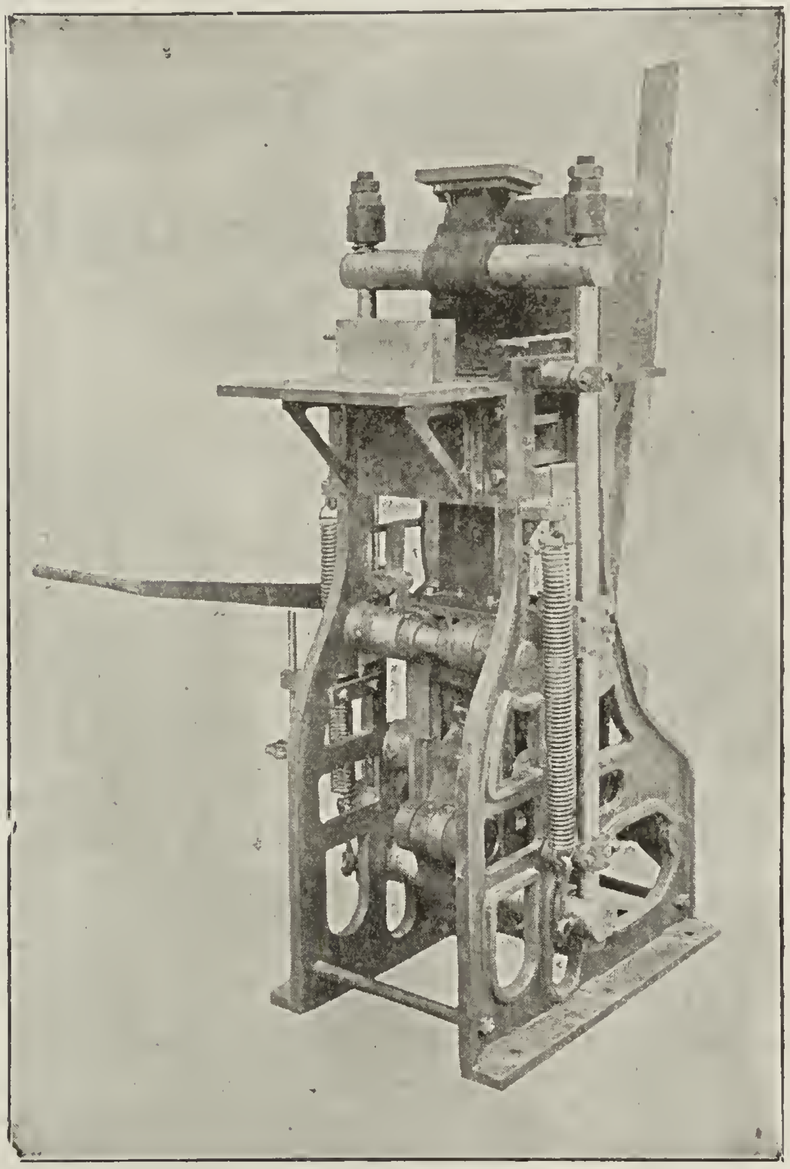
THE FERNHOLTZ PATENT MOLD BOX.

No old style Liners. The Blocks are adjustable and molds are always one size. We have put them in most all makes of Dry Press machines. Easily and quickly adjusted. They are made entirely out of chilled iron, the hardest known metal.

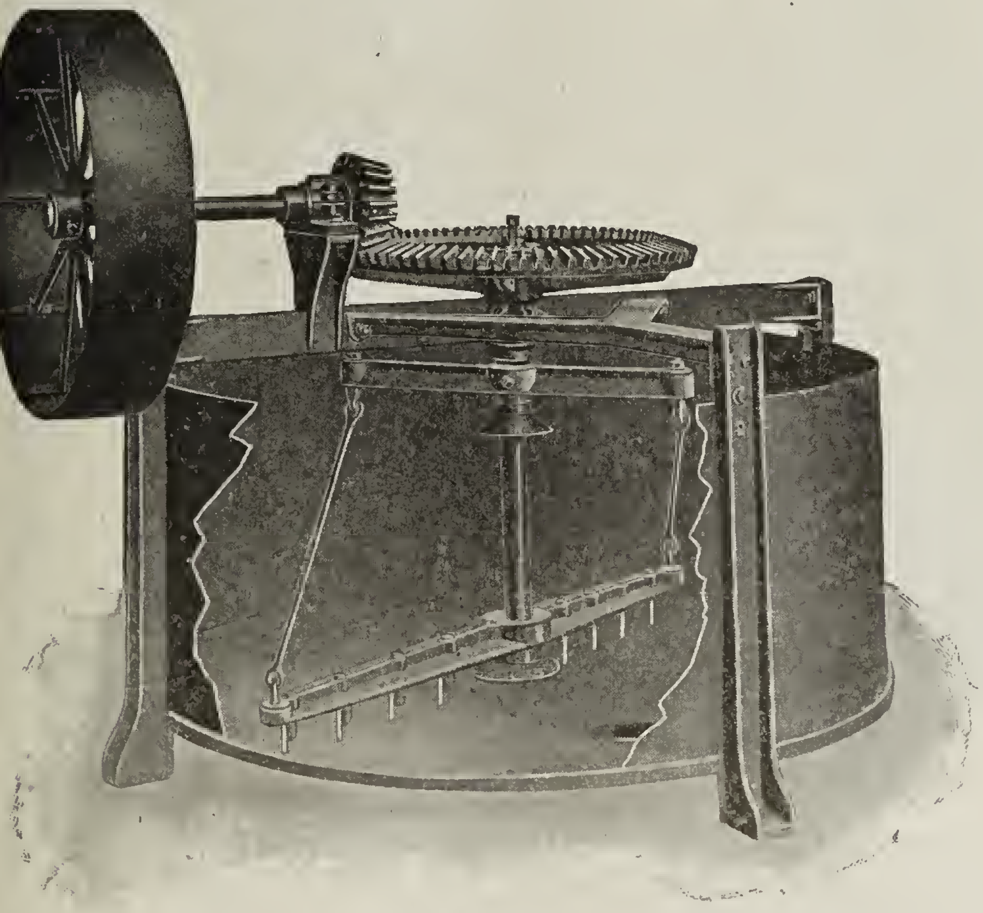
GRATH PATENT HAND POWER PRESS.

Especially adapted for ornamental designs. Any size brick up to 12⅝ inches long, 10 inches wide and 4¼ inches thick.

Brick set into kiln direct from press.



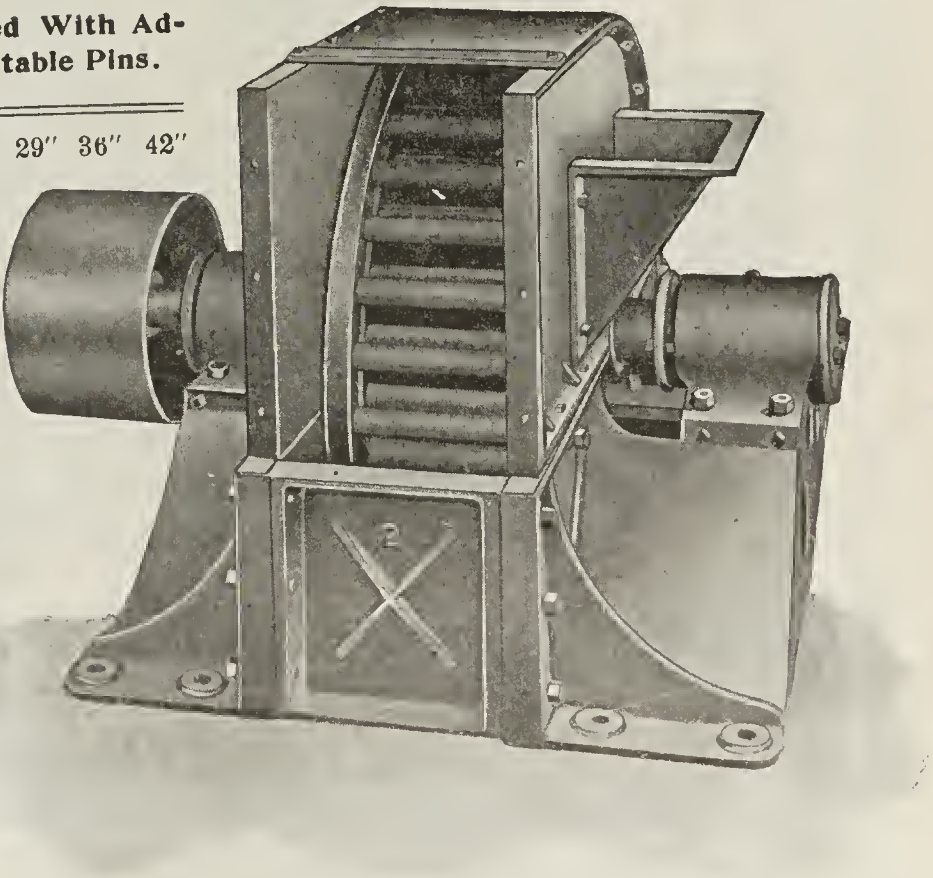
GRATH PATENT HAND POWER PRESS.



A GOOD MIXER IS ALWAYS APPRECIATED.

Fitted With Adjustable Pins.

Sizes 29″ 36″ 42″



THE FERNHOLTZ CLAY PULVERIZER.

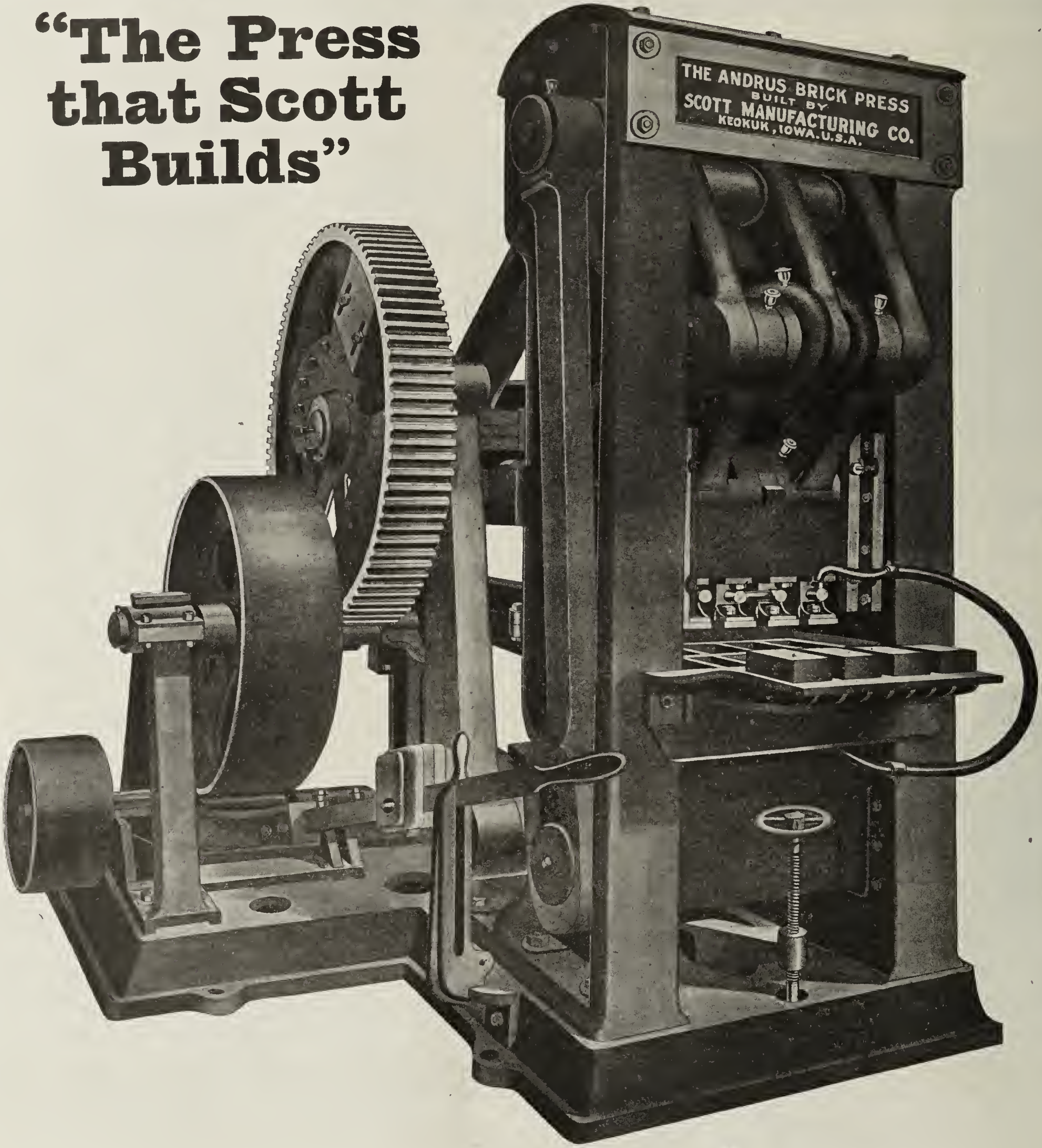
The Fernholtz Brick Machinery Co.

Cable Address "Fernbrick." Western Union Code.

Boyle Avenue and Old Manchester Road, ST. LOUIS, MO., U. S. A.

One Glance Ought to Convince You

"The Press that Scott Builds"



"Makes Brick every day" because it never takes time to lay up for repairs.

SCOTT MANUFACTURING COMPANY

Works: Keokuk, Iowa. *ST. LOUIS, MO.*

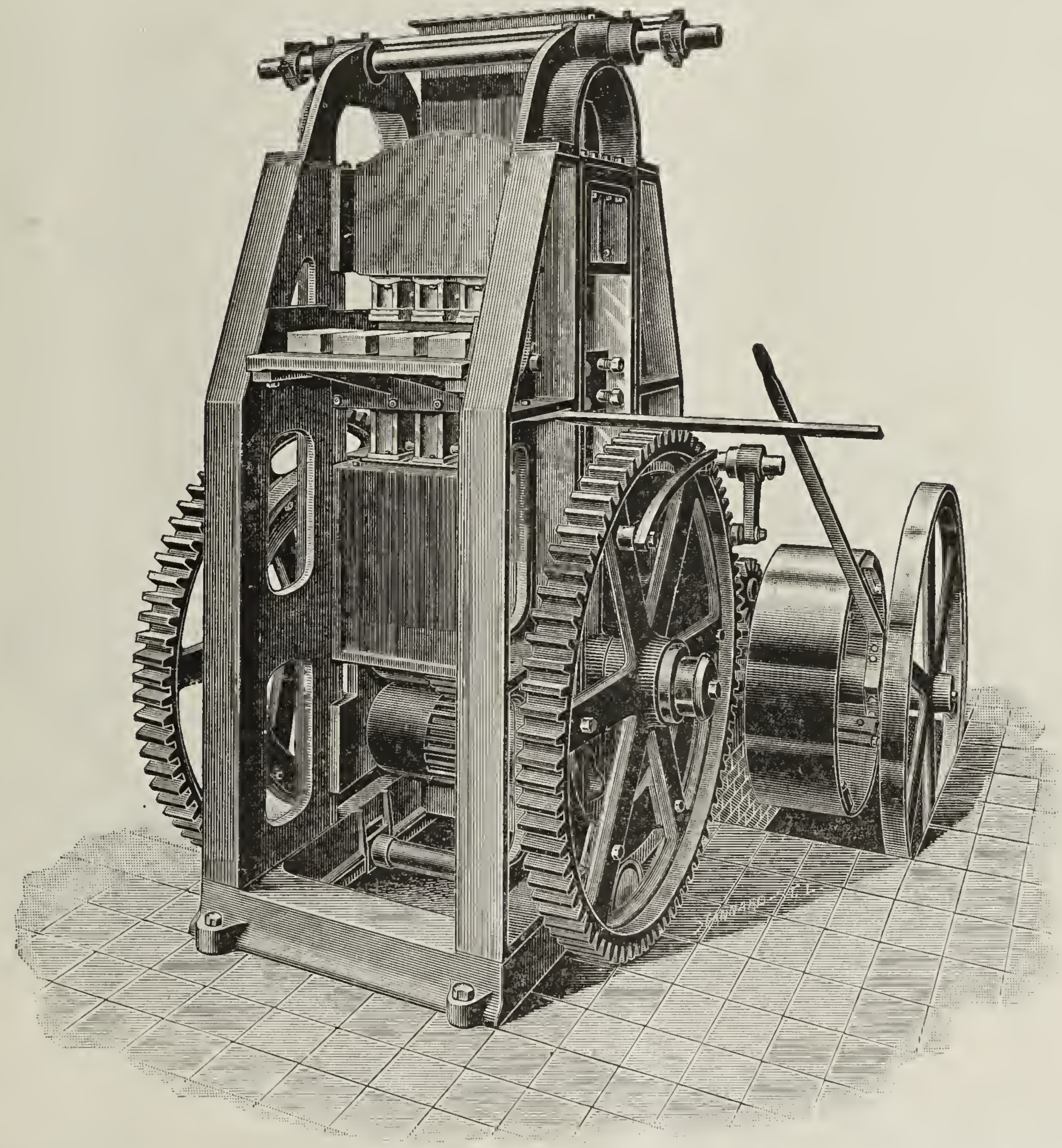
Call and see us in our new office, 609-610 Commonwealth Trust Building.

PERFECTION REALIZED

IN THE

RELIANCE DRY PRESS BRICK MACHINE

(PATENTED)



Main
Features:
Strength
Durability
Simplicity
Saves Fuel
and
Costs Less

No
Toggles
No
Links
No
Pins
to
Wear

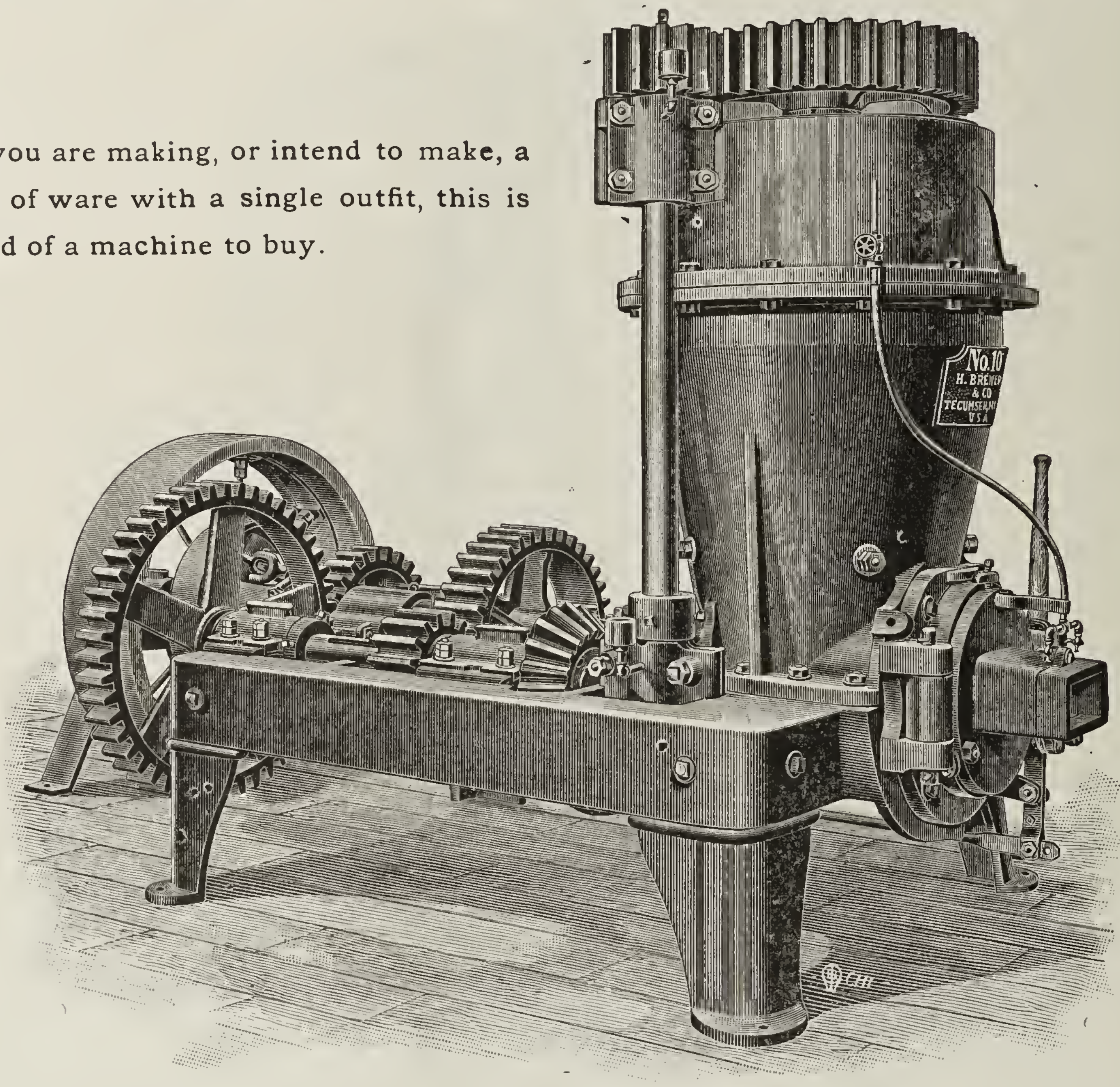
STRONGEST AND MOST POWERFUL BRICK PRESS ON THE MARKET

FOR PRICES AND FURTHER PARTICULARS ADDRESS THE

RELIANCE MACHINE AND TOOL WORKS
ST. LOUIS, MO.

COMBINED
BRICK TILE AND HOLLOW BLOCK
MACHINES

If you are making, or intend to make, a variety of ware with a single outfit, this is the kind of a machine to buy.


No.10
H. BREWER & CO
TECUMSEH, MICH.
U.S.A.

There Are Three Sizes

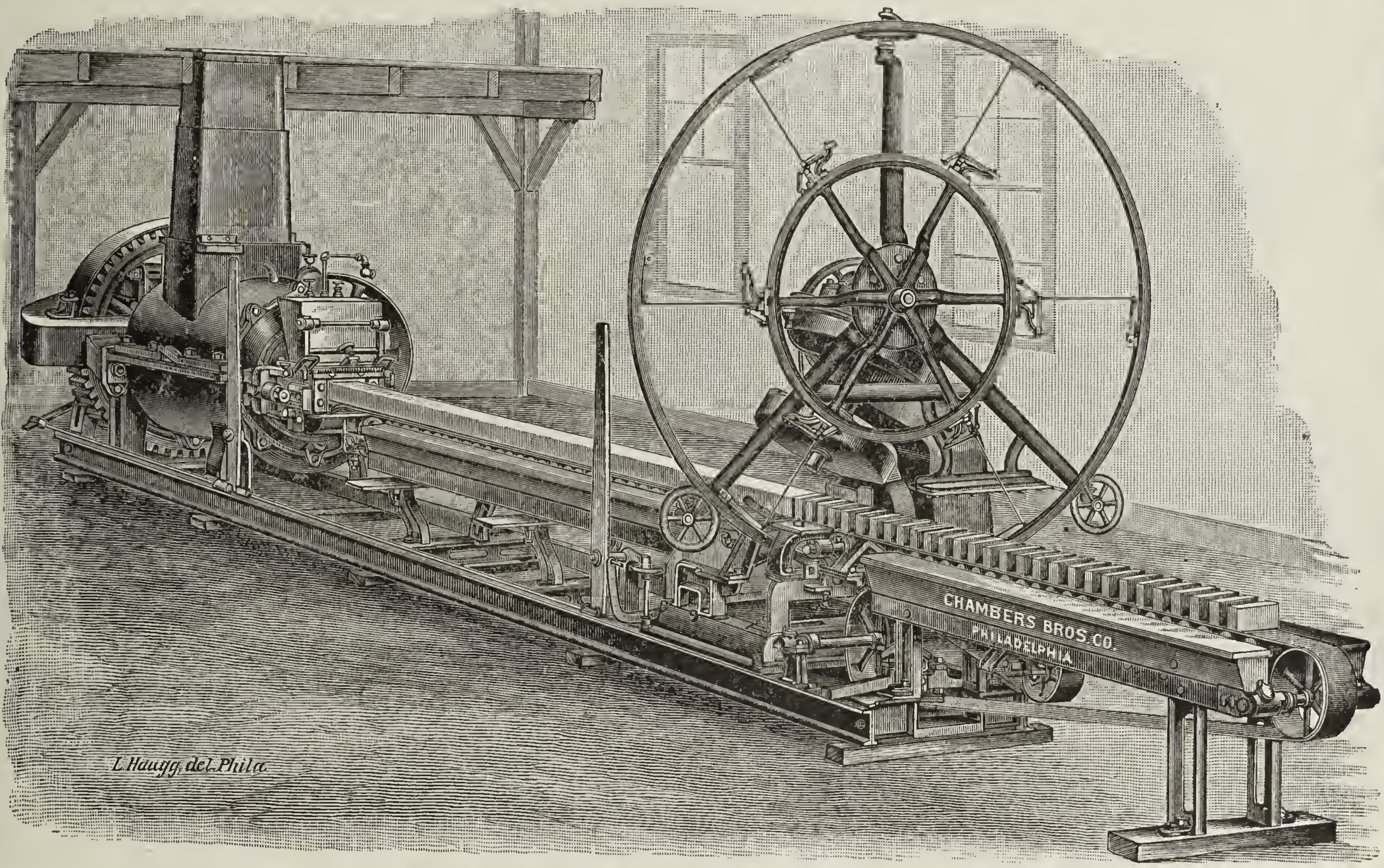
To select from, one of which will suit the profitable operation of your plant whether the output is great or small. Ask for catalogs and references.

H. BREWER & CO., TECUMSEH,
MICHIGAN.

MACHINERY FOR BUILDING BRICK

AND FOR STREET PAVERS

ROUND CORNER PAVING BRICK WITHOUT REPRESSING


CHAMBERS BROS. CO.
PHILADELPHIA
L. Haugg, del. Phila.

THE CHAMBERS AUTOMATIC SIDE-CUT BRICK MACHINE.

Automatic End Cut Brick Machines of five sizes, having capacity from 10,000 to over 100,000 brick daily under favorable conditions.

CHAMBERS BROTHERS COMPANY

52D AND MEDIA STREETS

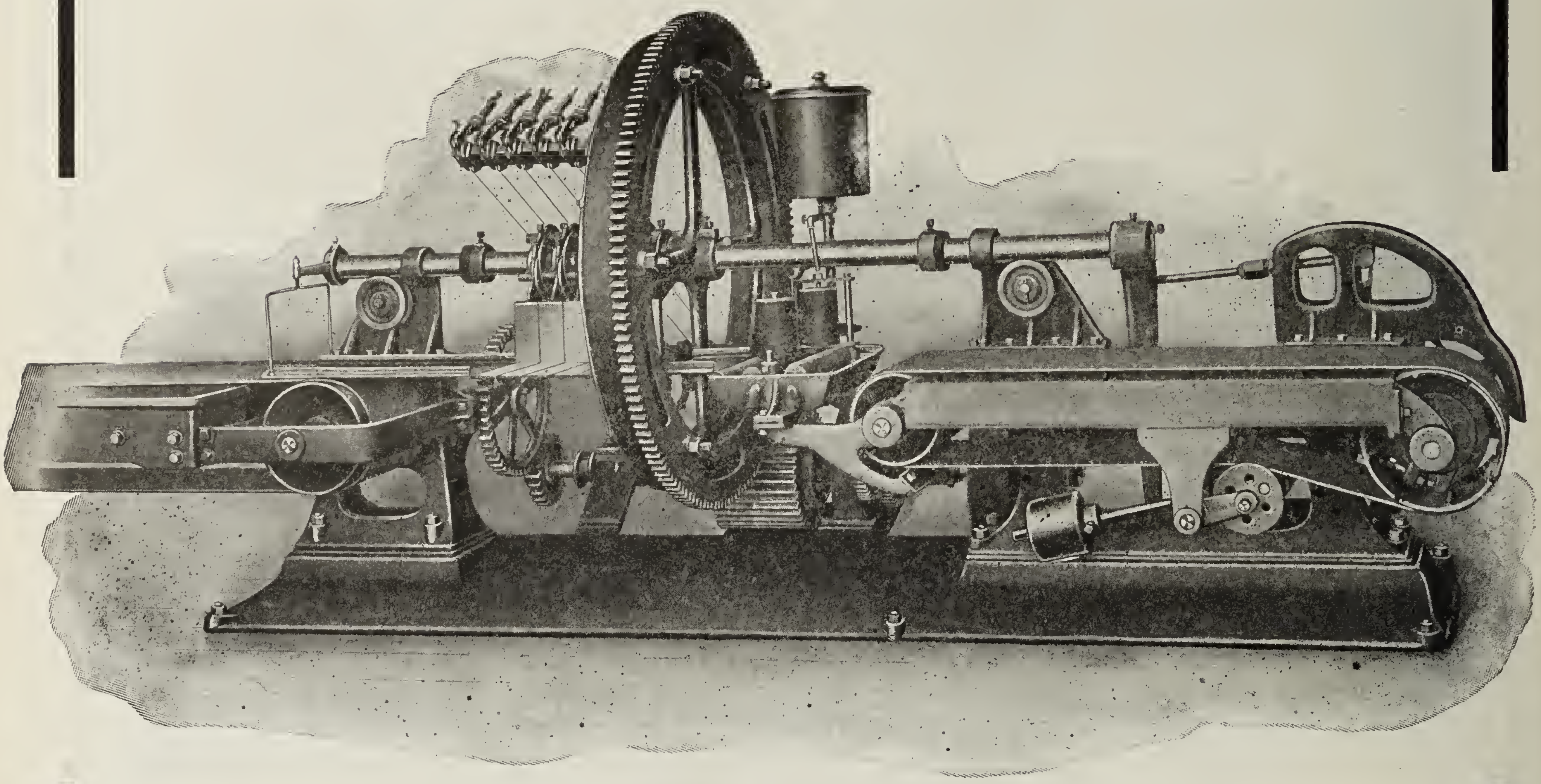
PHILADELPHIA, PA.

E. R. FRAZIER, Chicago Agent,
59 West Jackson Boulevard.

REVOLUTION IN

Automatic Cutters

Simple, Accurate, Light Running, Continuous Motion,
Perfect Brick.



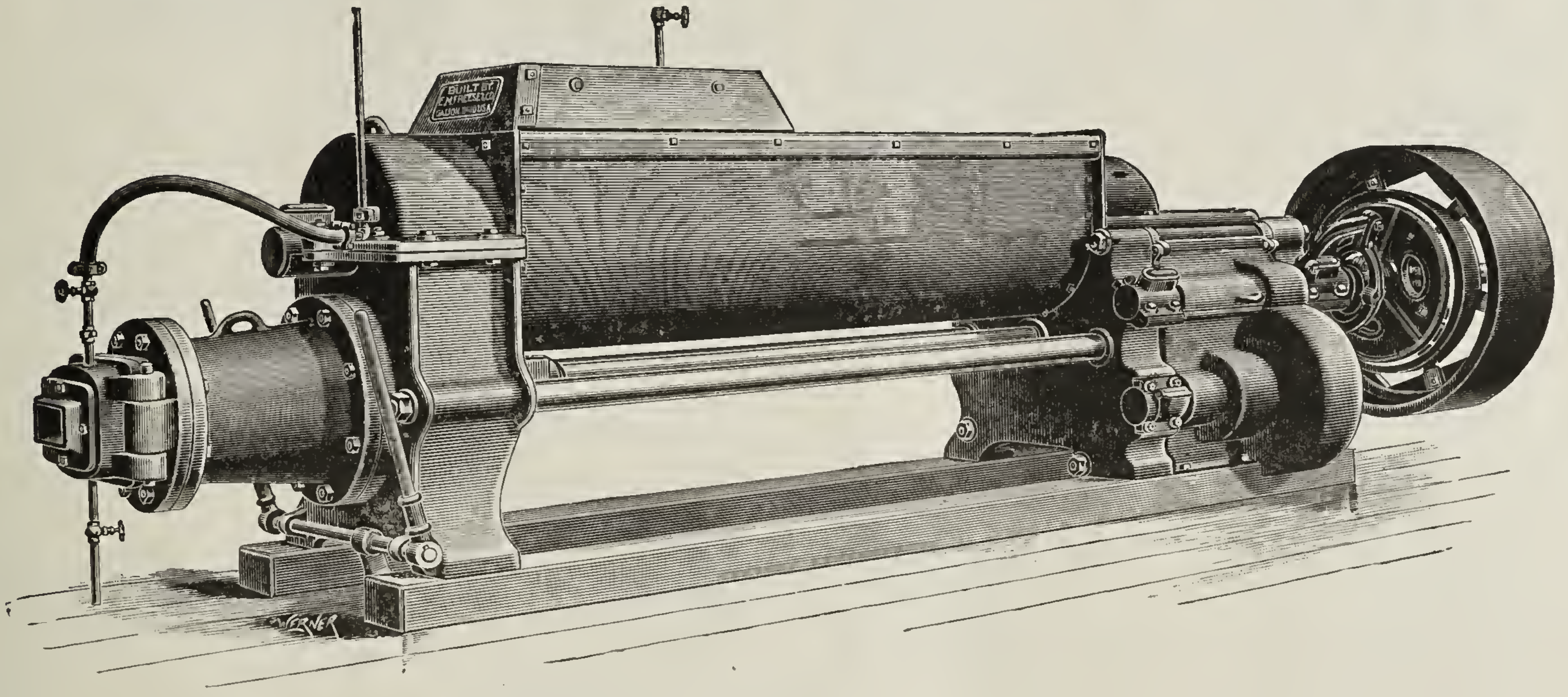
No. 25 Automatic Side Cut Brick Cutter.

THERE has never been introduced to the trade such a combination of excellent features, simplicity, accuracy and durability, as those embodied in our No. 25 Cutter. This cutter is beyond doubt the biggest value in cutters on the market today. Send for complete description. Our new catalogue is ready for distribution. If you haven't a copy send for one. It gives full information regarding our complete line of Dry Press, Stiff Mud and Soft Mud Brick Machinery, Roofing Tile Machinery, Sewer Pipe Machinery, Sand Lime Brick Machinery, Cement Machinery, Waste Heat, Steam and Hot Air Dryers and every appliance used in the clay trade.

The American Clay Machinery Co.

BUCYRUS, OHIO, U. S. A.

UNION BRICK MACHINES



We build these Machines in five sizes. Capacities to 10,000 brick per hour.

Several hundred are in everyday use. They do first-class work and are convenient, economical and durable. This can be verified by investigation.

We also build Brick Machines with separate Pug Mill.

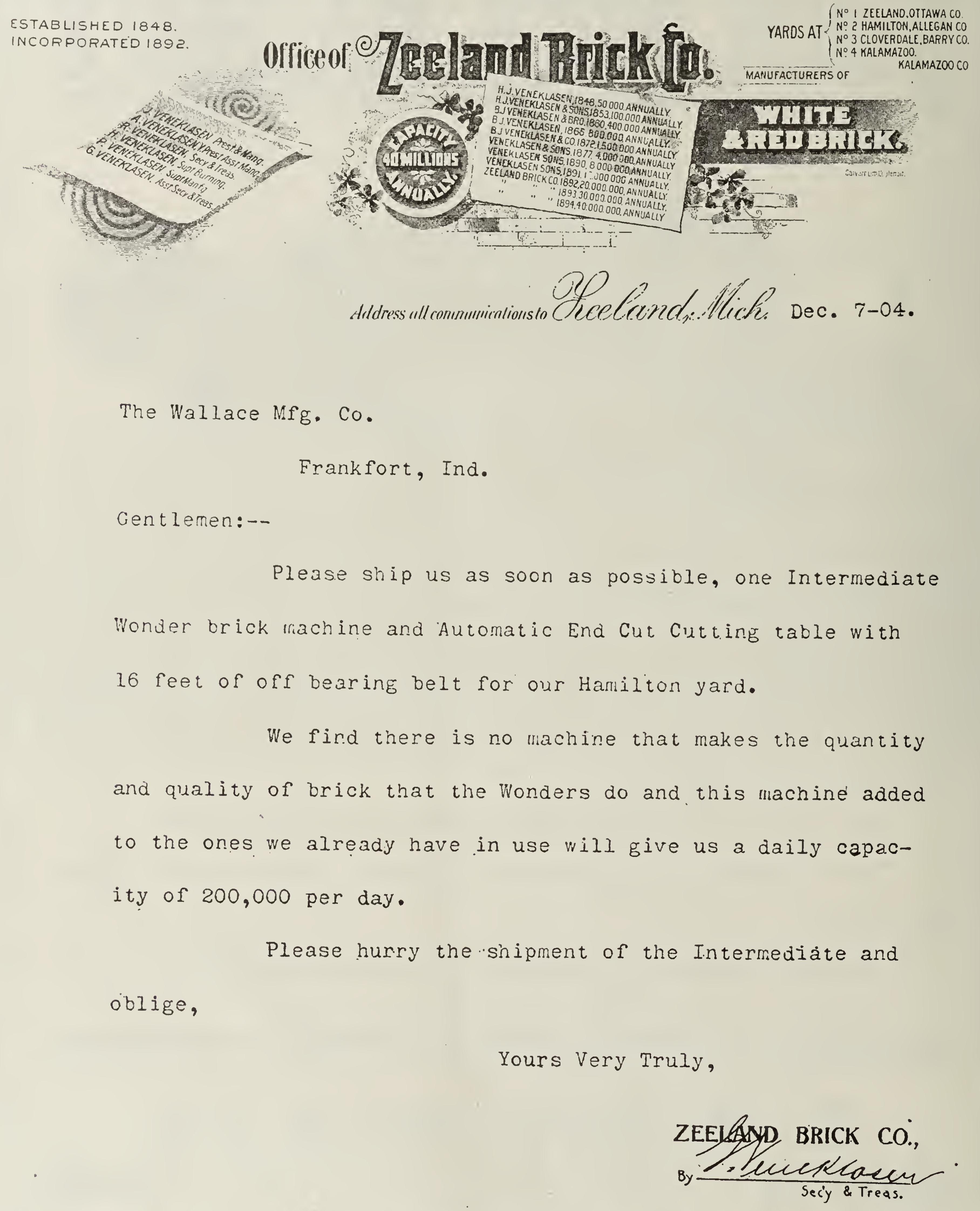
Don't forget our Automatic Cutters. **They give satisfaction.**

State your requirements and let us furnish particulars.

E. M. FREESE & CO.

GALION - - - - OHIO

WE PAVE THE WAY TO PROSPERITY.



ESTABLISHED 1848.
INCORPORATED 1892.

Office of Zeeland Brick Co.

J. VENEKLASEN, Prest. & Mang.
A. VENEKLASEN, V. Prest. Asst. Mang.
R. VENEKLASEN, Secy & Treas.
H. VENEKLASEN, Supt. Burning.
P. VENEKLASEN, Supt. Manfg.
G. VENEKLASEN, Asst. Secy & Treas.

CAPACITY 40 MILLIONS ANNUALLY.

H. J. VENEKLASEN, 1848, 50 000. ANNUALLY.
H. J. VENEKLASEN & SONS, 1853, 100.000 ANNUALLY.
B. J. VENEKLASEN & BRO. 1860, 400.000 ANNUALLY.
B. J. VENEKLASEN, 1866. 800.000 ANNUALLY.
B. J. VENEKLASEN & CO. 1872, 1,500.000 ANNUALLY.
VENEKLASEN & SONS. 1877. 4,000 000, ANNUALLY.
VENEKLASEN SONS, 1890. 8 000 000, ANNUALLY.
VENEKLASEN SONS, 1891. 1[illegible].000 000 ANNUALLY.
ZEELAND BRICK CO. 1892, 20.000.000, ANNUALLY.
" " " 1893. 30.000.000. ANNUALLY.
" " " 1894. 40.000.000. ANNUALLY

YARDS AT
Nº 1 ZEELAND, OTTAWA CO.
Nº 2 HAMILTON, ALLEGAN CO
Nº 3 CLOVERDALE, BARRY CO.
Nº 4 KALAMAZOO. KALAMAZOO CO

MANUFACTURERS OF
WHITE & RED BRICK.

Address all communications to Zeeland, Mich. Dec. 7-04.

The Wallace Mfg. Co.

Frankfort, Ind.

Gentlemen:--

Please ship us as soon as possible, one Intermediate Wonder brick machine and Automatic End Cut Cutting table with 16 feet of off bearing belt for our Hamilton yard.

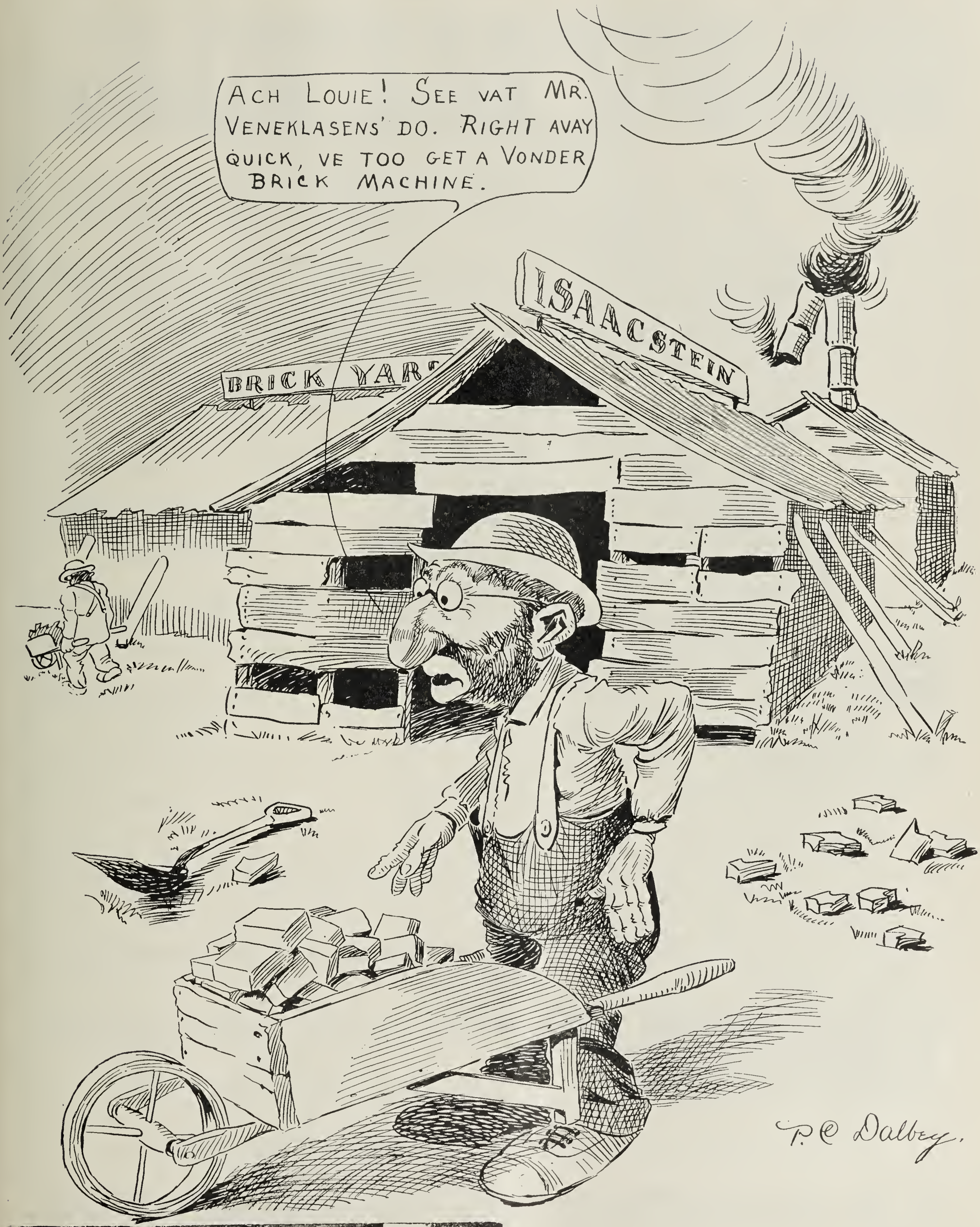
We find there is no machine that makes the quantity and quality of brick that the Wonders do and this machine added to the ones we already have in use will give us a daily capacity of 200,000 per day.

Please hurry the shipment of the Intermediate and oblige,

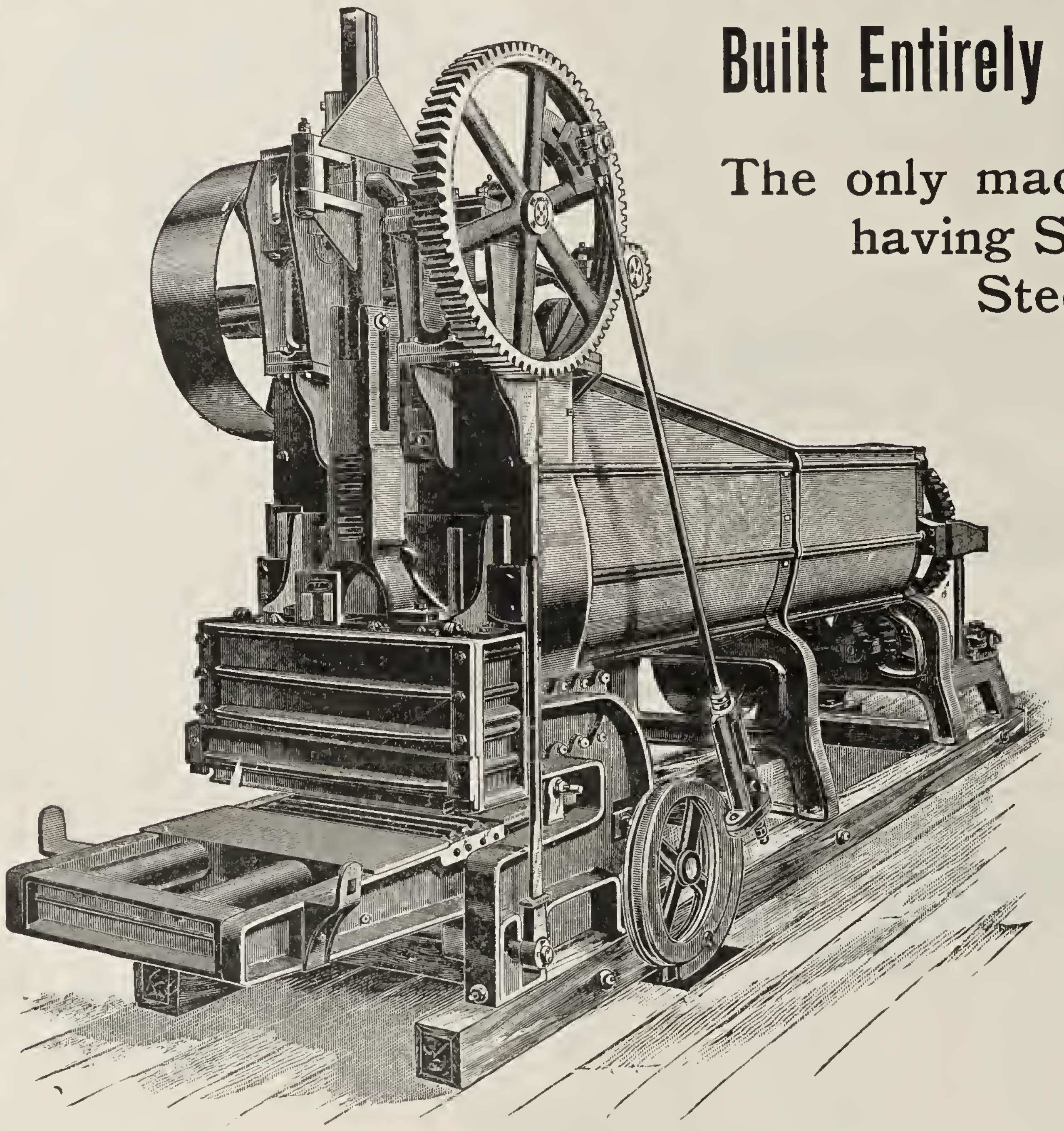
Yours Very Truly,

ZEELAND BRICK CO.,
By J. Veneklasen
Sec'y & Treas.

The Wallace Mfg. Co., Frankfort, Ind., U. S. A.


ACH LOUIE! SEE VAT MR. VENEKLASENS' DO. RIGHT AVAY QUICK, VE TOO GET A VONDER BRICK MACHINE.
ISAACSTEIN
BRICK YARD
P. C. Dalbey.

THE POTTS
HORIZONTAL BRICK MACHINE



Built Entirely of Iron and Steel.

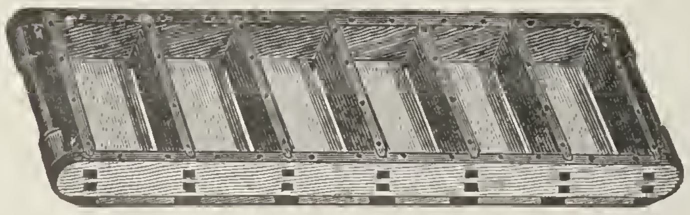
The only machine of this class
having Steel Gear and
Steel Shaft.

Built of the Best
Material by the Best
Workmen.

Simple, Strong and
Durable.

No extra pug mill required to enable working the clay direct from the bank. Its great strength enables working the clay as stiff as practicable, insuring brick which will be STRAIGHT and SQUARE.

THE LEADER OF ALL SAND MOULD MACHINES.



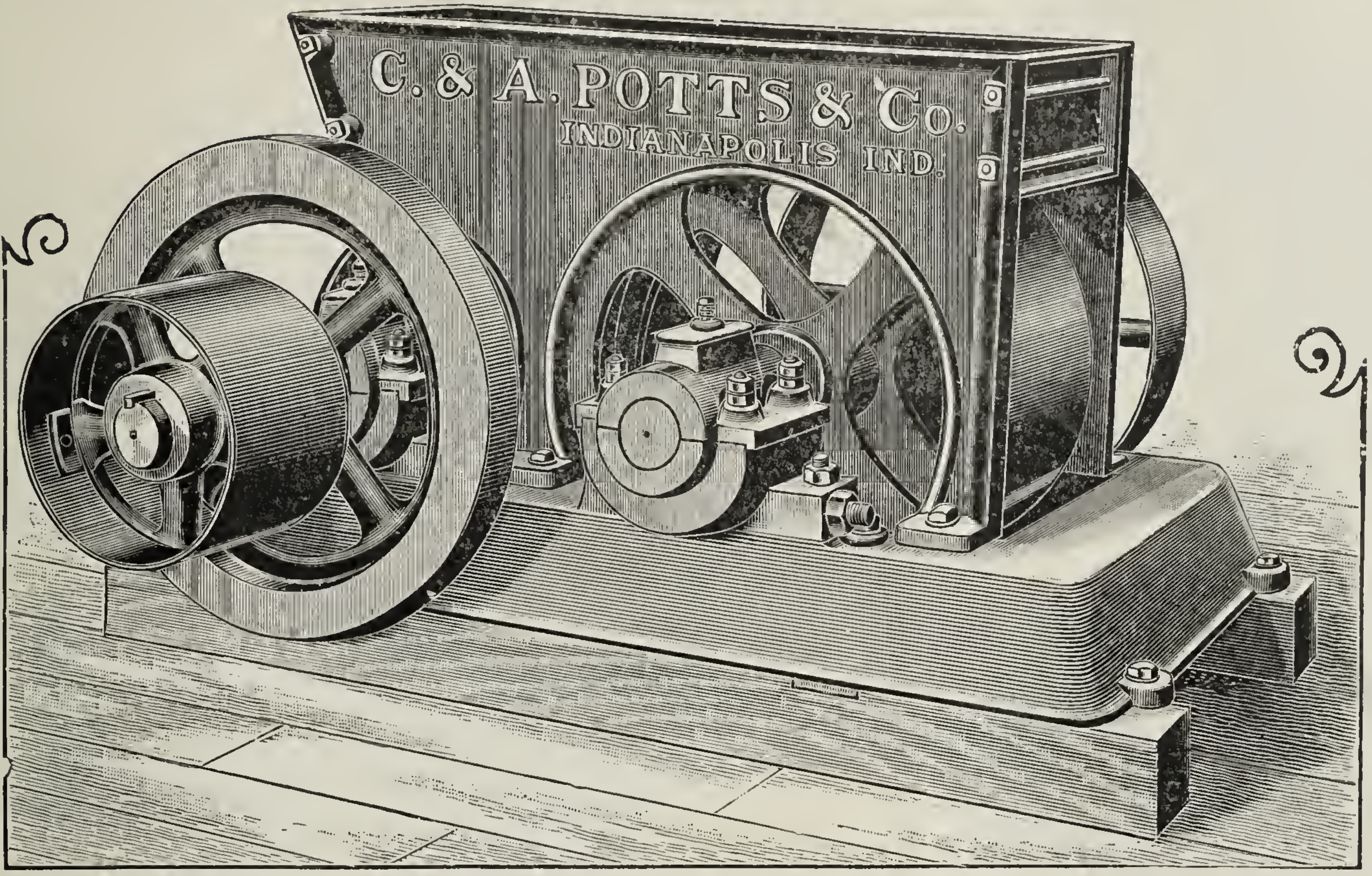
BRICK MOULDS A SPECIALTY

QUALITY IS OUR AIM.

We manufacture a complete line of Brick Yard Supplies. Write for prices.

C. & A. POTTS & CO., Indianapolis, Ind.

THE POTTS DISINTEGRATOR


C. & A. POTTS & Co.
INDIANAPOLIS IND.

Is not a spite machine, but is built the best possible. Having Heavy Chilled Rolls, Ring Oiling Bearings, Shafts of Steel and large in Diameter. The most successful machine for grinding out sticky clays and separating the stone.

THE POTTS MOULD SANDER

Simple in Construction,

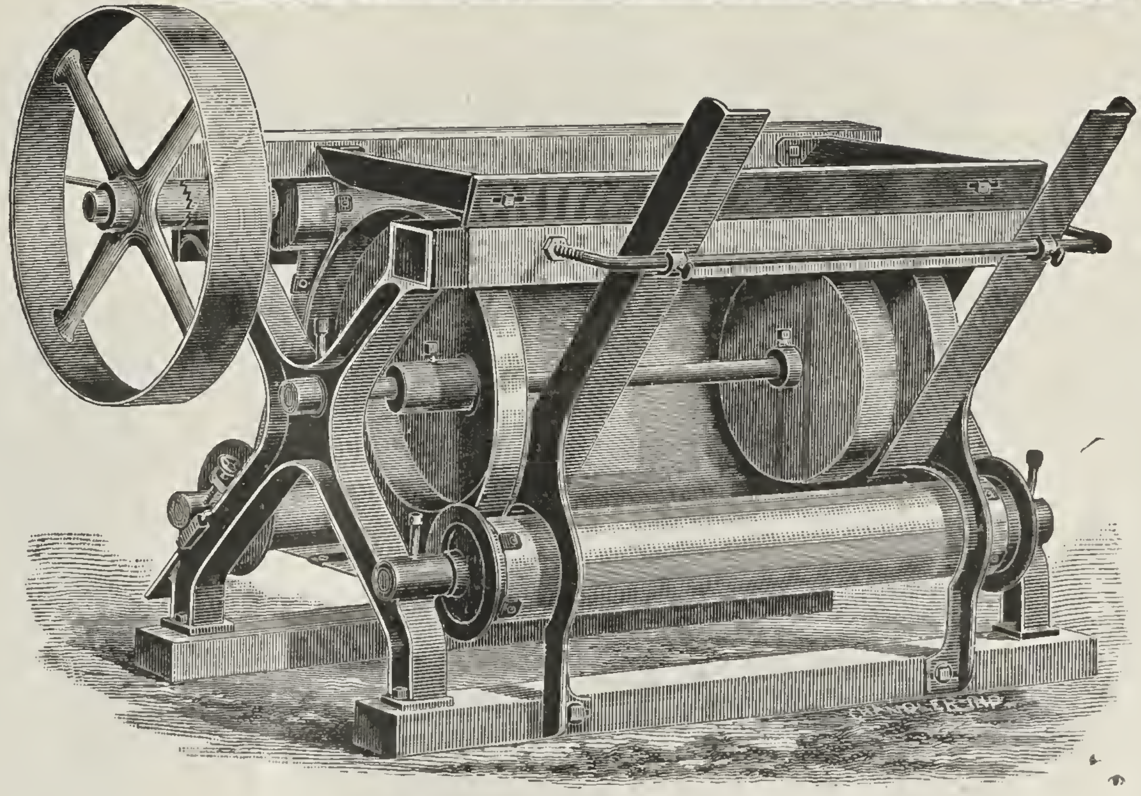
Strong and Durable,

Sands the Moulds Perfectly,

Never Strikes or gets Drunk,

Always Ready for Work,

No Brick Machine Complete without this Machine.



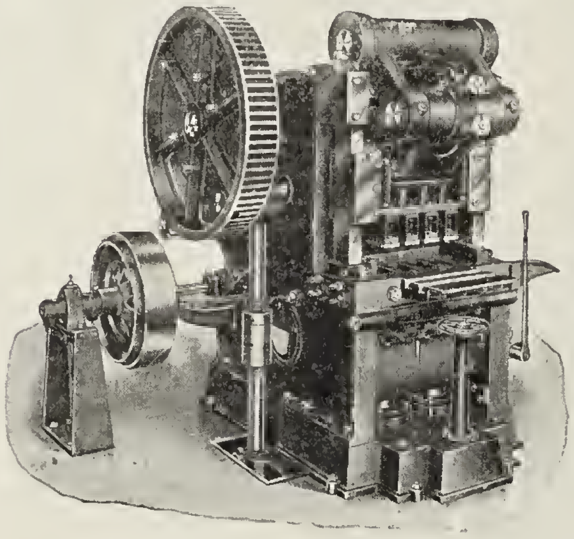
Patented February 5, 1889.

We make a specialty of equipping Sand Mould plants complete. We are the largest manufacturers of this class of machinery in the world. Write for prices.

C. & A. POTTS & CO., Indianaoplis, Ind.

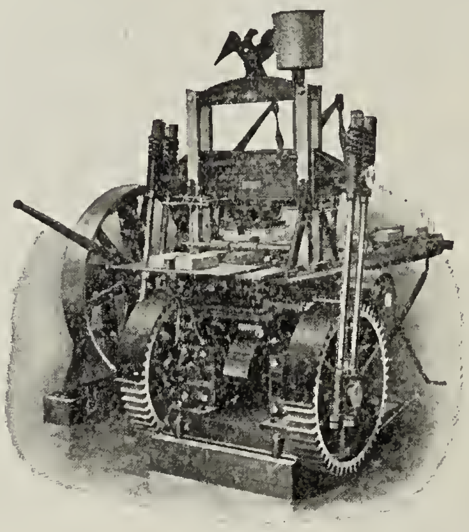
The American Clay Machinery

These are a few of the many Superior machines we manufacture for the Clay Trade. Large cuts



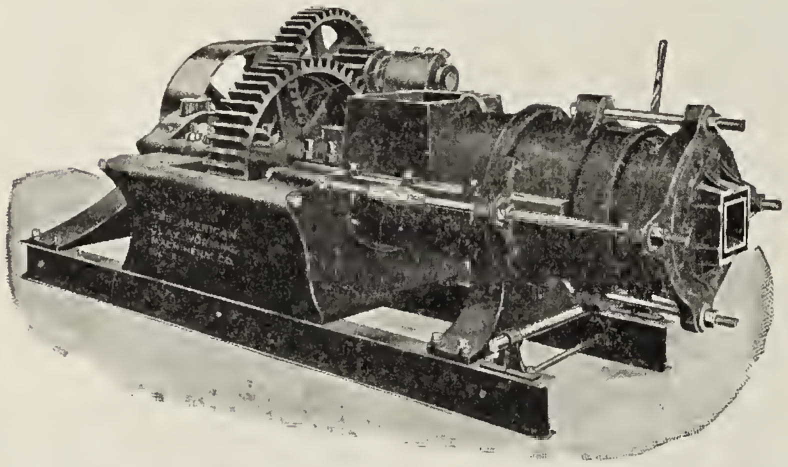
DRY PRESS BRICK MACHINERY.

We build a full line of Dry Press brick machinery. We have four styles and eight sizes, ranging in capacity from 1,000 to 3,000 brick per hour. This cut is our four mold, Moldel B press, especially adapted to Sand-Lime brick. Write for complete catalogue.

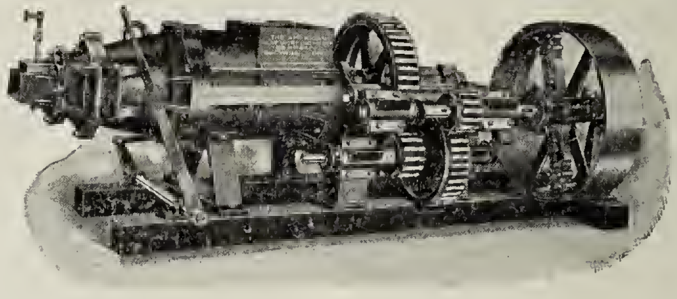


REPRESSES.

We build a large and complete line of represses in six sizes and styles. Capacity runs from 600 to 2.500 brick per hour. Send for our complete catalogue. This cut is of our double mold Eagle Repress.

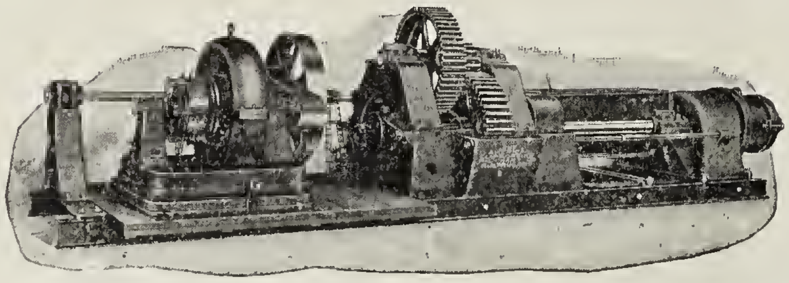


No. 40 AUGUR MACHINE FOR HOLLOW WARE.



No. 2 GIANT AUGER BRICK MACHINE.

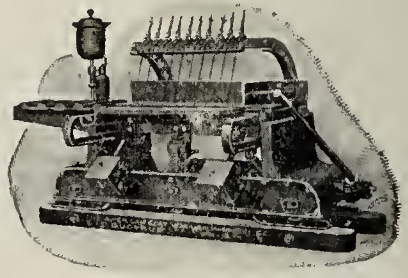
We build ten sizes and styles of Auger Machines. Capacities 1,500 to 10,000 brick per hour. Write for complete list.

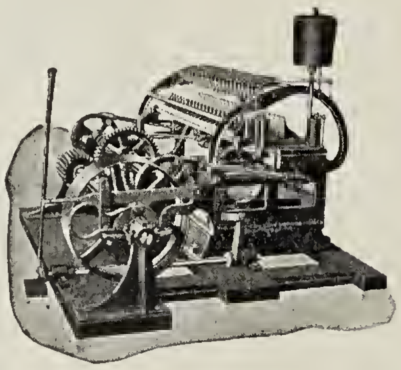


No. 23 ELECTRICAL DRIVEN, LOW FRAME, COMBINED MACHINE.

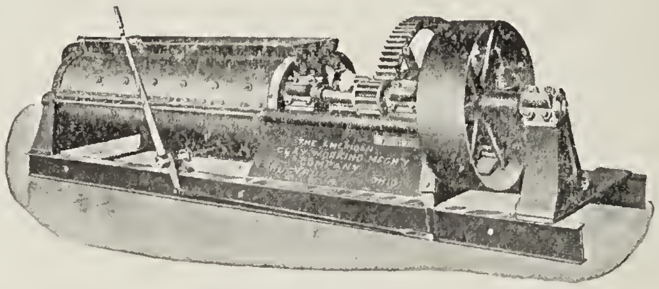
We make a full line of electrical driven clay-working machinery. Send for catalogue.

SEMI-AUTOMATIC AND HAND POWER CUTTERS





We make twenty-five styles of semi-automatic and hand power cutters for brick, tile and hollow ware. Write for full list and description.

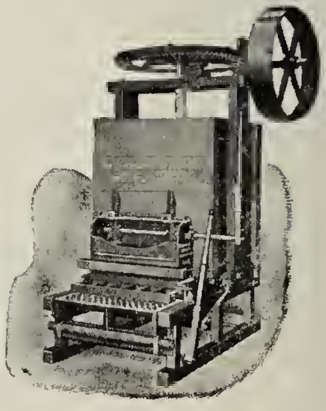


No. 38 DOUBLE SHAFT PUG MILL.

We build twenty different styles and sizes of pug mills to suit the needs of varying clays. Send for complete list and description.

SOFT MUD BRICK MACHINES.

Our Eagle Steam and Horse Power Brick Machines are the best built for small capacity. They are complete with molds, etc. Write for our soft mud booklet. These machines are especially adapted for export.

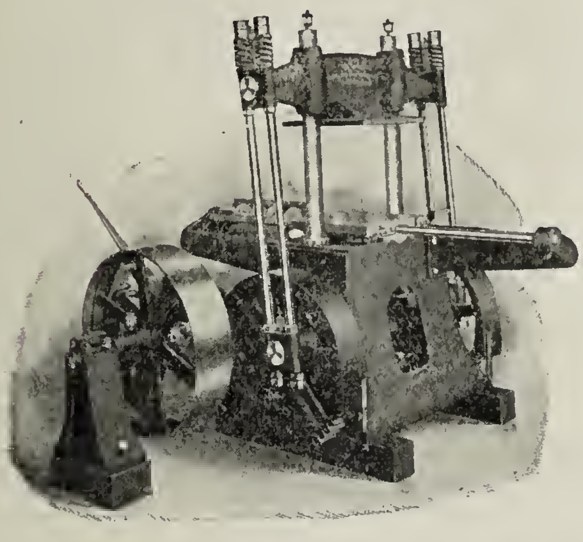


Dry Press, Stiff Mud and Soft Mud Brick Machinery. Sand-Lime Brick Machinery, Cement, and Pottery Machinery. Waste Heat and Steam Dryers
Everything needed by the Clay Workers.

Company, Bucyrus, Ohio, U. S. A.

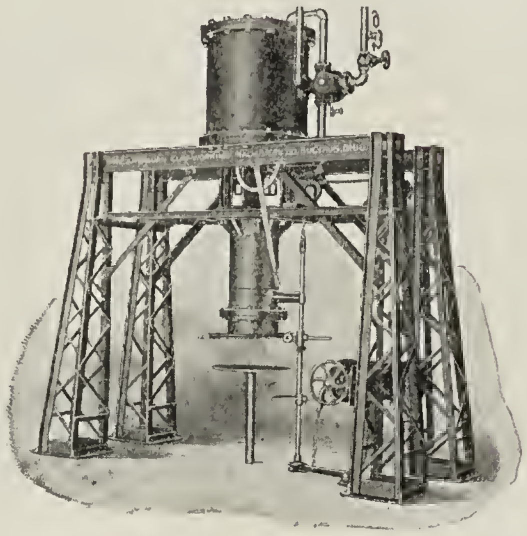
Built Right Run Right

and full descriptions of these and a hundred other machines we make will be sent upon request.



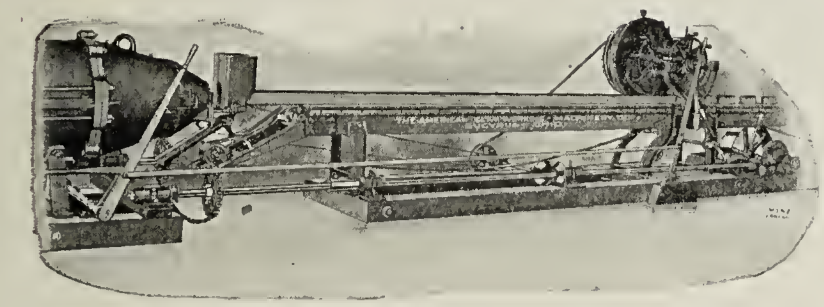
ROOFING TILE PRESS.

We build four styles of Roofing Tile Presses for the pressing of Hip Rolls, Crestings, etc. Write for complete description.



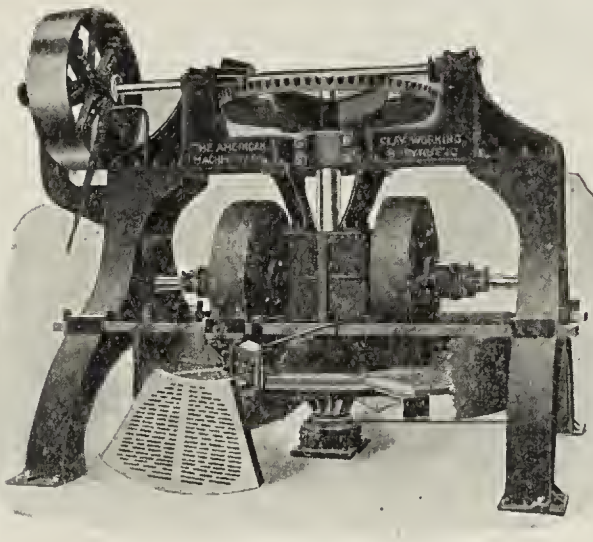
SEWER PIPE MACHINERY.

We build three styles of Sewer Pipe Presses, together with all appliances for a complete plant. Send for our big catalogue.



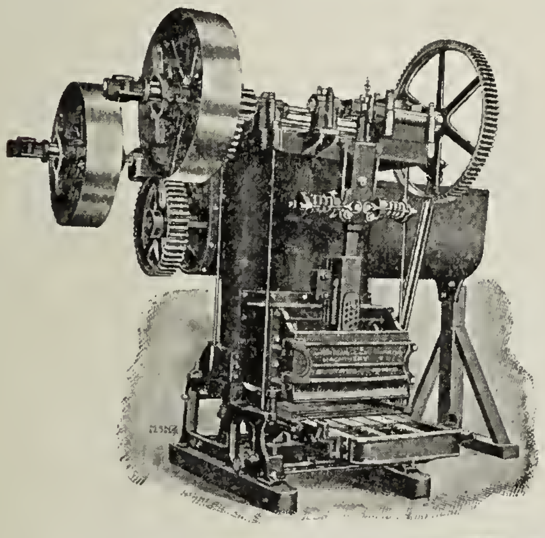
AUTOMATIC, END CUT, BRICK CUTTER, STYLE "P."

For end cut brick this machine is excellent. We build several styles of automatic cutting tables. Write for particulars.



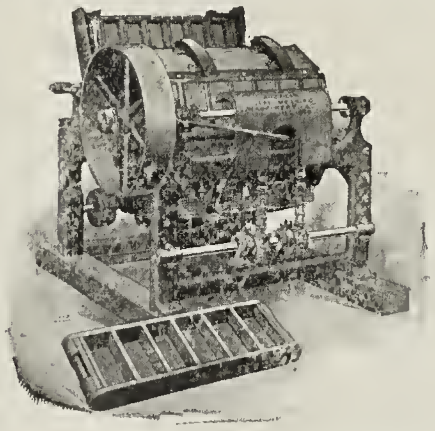
DRY AND WET PANS.

We build twenty styles of Dry and Wet Pans in varying capacity. They are all constructed of iron and steel and are most substantial. A complete description of the full line will be sent for the asking.



SAND MOLD BRICK MACHINE.

This machine is especially adapted for sand mold brick. It is an excellent machine. Write for a complete description.

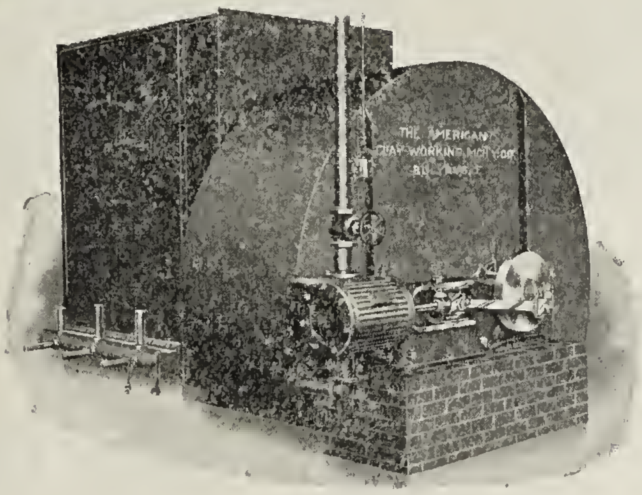


CHAMPION MOLD SANDER.

This is an excellent machine and sand molds evenly and economically. It is entirely automatic. Send for description.

WASTE HEAT AND STEAM DRYERS.

We build both waste heat and steam dryers and can dry the most tender clay. Plans and estimates furnished upon application. We can dry your product at one-half the present cost or less. The cut is of our waste heat dryer outfit.



OUR LINE OF CARS.

We build dry cars and clay dump cars in forty varieties. Send for car catalogue as it is sure to contain just what you want.

THE AMERICAN CLAY MACHINERY COMPANY

BUCYRUS, OHIO, U. S. A.

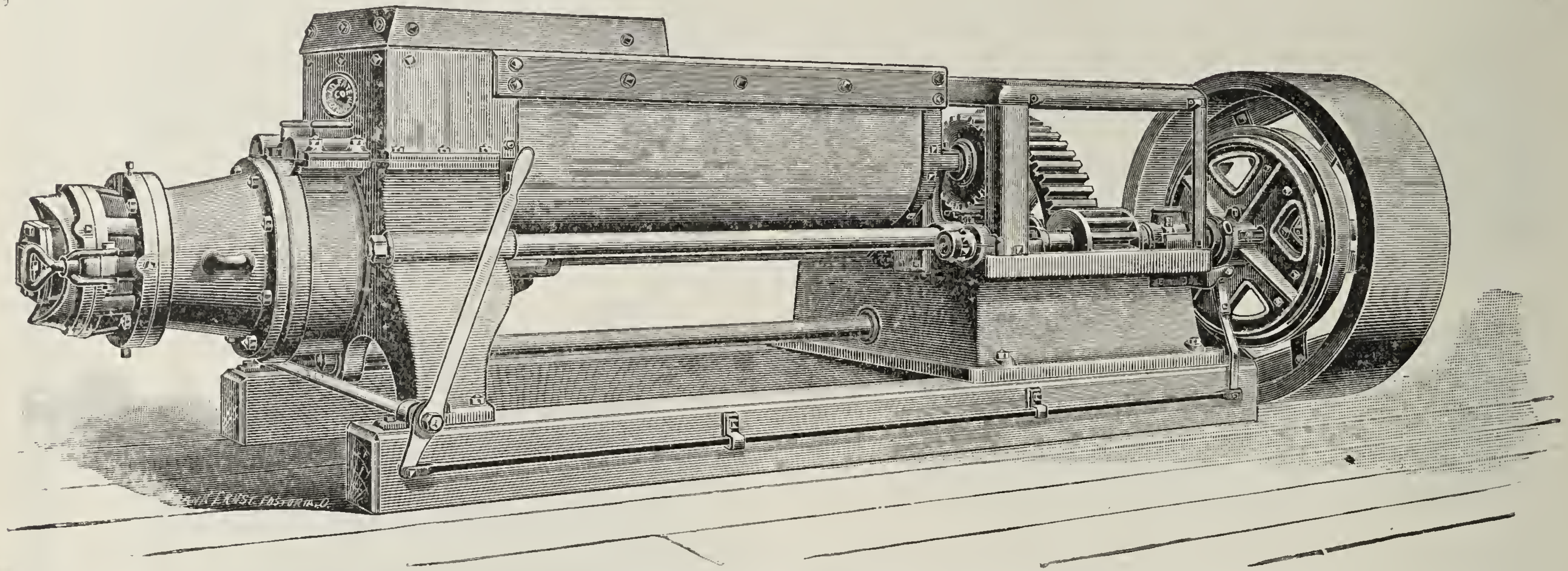
Built Right Run Right

THE PREMIER LINE
THE J. D. FATE COMPANY

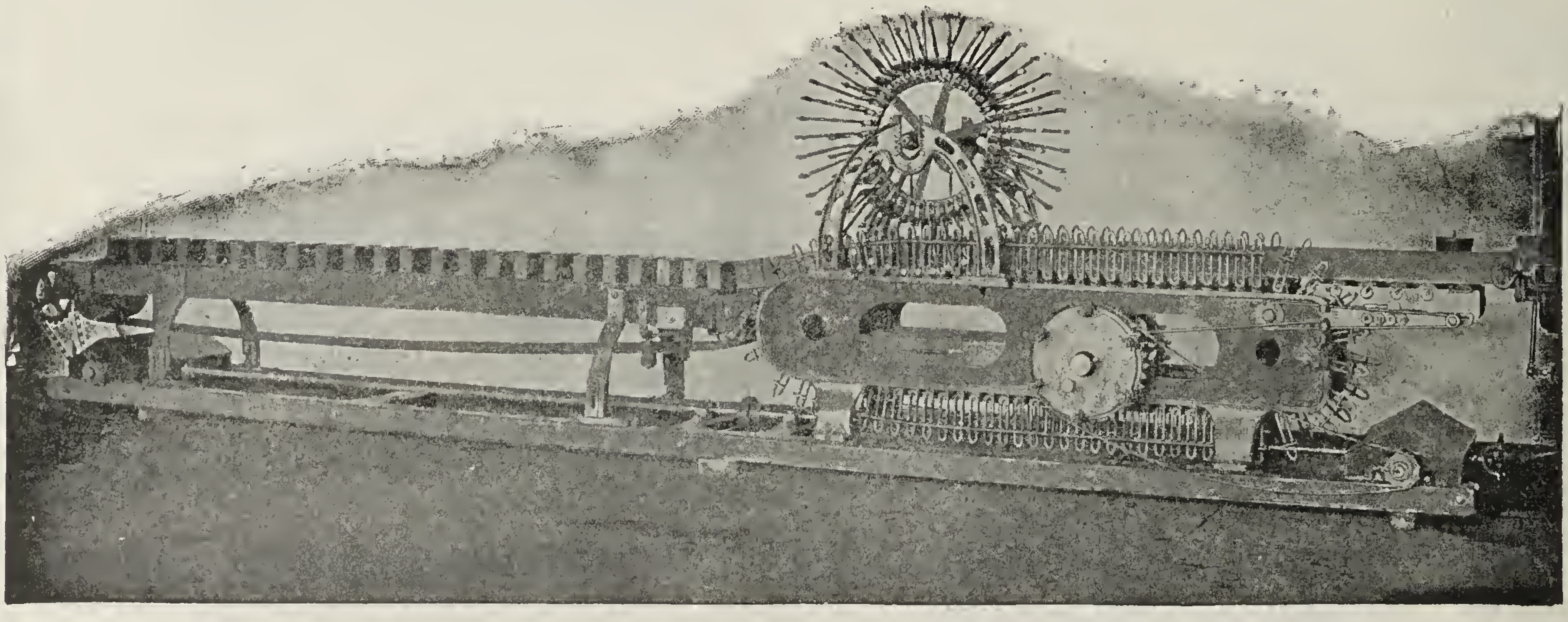
THE "PREMIER"

Combined Brick Machine

THE LARGEST LINE OF AUTOMATIC CUTTING TABLES IN THE WORLD



WITH BENSING'S AUTOMATIC SIDE-CUT BRICK TABLE.



Make a combination of Brick Machinery which is pronounced by practical brick makers to be the most perfect arrangement of stiff mud machinery now on the market.

It is unequaled for strength, durability, capacity and quality of ware produced.

Write us for catalog and full particulars of the "Premier" line of Clay Working Machinery.

THE J. D. FATE CO., - Plymouth, Ohio

WESTERN REPRESENTATIVES:

B. E. LA DOW, 701 Dwight Bldg., Kansas City, Mo.

Pacific Coast: LEW THORNE, Grand Hotel, San Francisco, Cal.

CLAY RECORD

Vol. XXVI. No. 4. CHICAGO, FEBRUARY 28, 1905. Semi-Monthly, $1.00 per Year
Single Copies, - 10 Cents

THE NATIONAL ASSOCIATION MANUFACTURERS OF CLAY-WORKING APPLIANCES AND THEIR BIRMINGHAM EXHIBIT.

The National Association of Manufacturers of Clay-working Appliances held their twelfth annual meeting in one of the dining rooms of the Hillman Hotel at Birmingham, Ala. The election of officers resulted in putting into office all new members with the exception of the treasurer and secretary, who were re-elected.

The new officers are:

C. W. Raymond, Dayton, O., President.

J. H. Flood, Chicago, Ill., Vice President.

J. H. Chambers, Philadelphia, Pa., Treasurer.

Geo. H. Hartwell, Chicago, Ill., Secretary.

L. W. Penfield, Willoughby, O., Chairman Executive Committee.

W. N. Durbin, Anderson, Ind., Executive Committee.

Albert Potts, Indianapolis, Ind., Executive Committee.

Since the last meeting this association has had a very steady growth, twenty-two being admitted during the Birmingham sessions, so that now the membership is nearly seventy. With only a few exceptions every dealer or manufacturer in clay-working machinery of the United States and Canada are now members.

This association keeps aloof from the making of prices or combinations on clay-working machinery, but pays a close attention to the credit of possible buyers. The placing of its advertising is another feature that is well looked into.

One of the greater objects of the Association is the maintaining of an exhibit room in connection with the National Brick Manufacturers' Association, seeing that every one's exhibit is properly installed and that all are treated as near alike as possible. The exhibit room at Birmingham, while not the largest, was conducted in the best possible manner, and so that each individual exhibit showed off to the very best advantage.

As one entered the door of the exhibit room at the right was the table of the Clay Record, with samples of this well-known semi-monthly clay journal for free distribution; also the Government Clay Statistics in pamphlet form, which were compiled by Jefferson Middleton of Washington, D. C.

Next to the right was the ever attractive exhibit of Chambers Bros. Co. of Philadelphia. It was a working model of a brick machine and cutting table. This same machinery was on exhibit at the Philadelphia Centennial in 1876, and there were members of the association at Birmingham that visited the Centennial and recognized the little model. J. H. Chambers and A. R. Root of Philadelphia, E. R. Frazier of Chicago and L. S. Morrison of Rome, Ga., were in charge of the exhibit.

C. W. Raymond, President, Dayton, Ohio.

F. Henry Angel represented the Jeffrey Mfg. Company of Columbus, Ohio, and had on display some large photographs of their swing hammer crusher. The Jeffrey company recently brought out this crusher and are now meeting with all kinds of success with it. Mr. Angel has complete charge of that department and is one of the best posted crusher men in this country.

Next to the Columbus exhibit was the exhibit of kilns by Frederick W. Dennis of Norfolk, Va., and Atlanta, Ga. Mr. Dennis was kept quite busy showing the merits of his kilns and was very successful at this meeting. The party who carried off a set of blue prints (through accident—no doubt) should return them at once.

The Brownell Co. of Dayton, Ohio, was represented by I. E. Jones, with catalogues and circulars and a general fund of information about engines and boilers.

The American Sand Lime Brick Co. came next, and was represented by W. N. Durbin of Anderson, Ind. A full line of sand lime brick of all colors and shades were exhibited. John J. Moroney was also connected with this exhibit and that of the Chicago Brick Machinery Company. A model of the "Berg" dry press and some catalogues were all he had to offer.

H. J. Flood, Vice-President, Chicago.

The Success Brick Machinery Co., Memphis, Tenn., had their little models of the Reid Success Car and the S. S. S. soft mud brick machine. Frank H. Reid is the president and manager of this company and represented it at the exhibit-room.

Wm. F. Scott of the Scott Manufacturing Co., Commonwealth Trust Bldg., St. Louis, Mo., was on hand with a model of the Andrus Press and a number of supplies that this firm sells in connection with the presser. To look at Mr. Scott you could plainly see that business is flourishing with his company.

The Dunlap Mfg. Company of Bloomington, Ill., was represented by O. W. Dunlap, the manager and inventor of this wonderful screen. Catalogues and full information were obtainable.

The Standard Dry Kiln Co., of Indianapolis, Ind., was represented by their southern representatives, J. S. Strand and H. Wirsching, who generally attends the meeting for them. Handsome catalogues telling all about drying were freely distributed.

B. F. Crawford, secretary of the Crawford & McCrimmon Co., Brazil, Ind., was the next with a small model of a drying system and catalogues of the different machinery that this firm manufactures.

S. D. Wright, the affable representative of the Atlas Car & Mfg. Company of Cleveland, Ohio, had the next exhibit. Catalogues and a very handsome pocketbook were freely given away.

F. M. Smythe, president and manager of the Thew Automatic Shovel Co., Lorain, Ohio, was there with photographs of steam shovels that his company had supplied to brickmakers. Their Southern agents, Shook & Fletcher, kept a watchful eye on prospective Southern buyers.

The publication, "Brick," of Chicago, was the next to make an exhibit. Journals and testimonials were freely given away. Harry de Joannis, the editor, held the space down.

J. W. Hensley of Indianapolis, Ind., the southern representative of the Wellington Machine Co., had one of the largest exhibits at the hall. Sand dryers, mould sanders and barrows were there. C. McDermott ably assisted Mr. Hensley in giving information and small pocketbook souvenirs.

W. E. Ellenberger and W. H. Caskey were the representatives that held the Cleveland Car Co.'s space down. Their home office is at West Park, O. They had catalogues illustrating their complete line of industrial railway equipment and also handed out to their friends some very handsome pocketbooks.

The Williams Patent Crusher & Pulverizer Co. of St. Louis, Mo., was represented by A. F. Williams. Photographs, circulars and a small model of their hammer crusher were in evidence.

Geo. H. Hartwell, Secretary, Chicago.

The American Clay Machinery Co., Bueyrus, Ohio., had a very creditable exhibit. It was the same exhibit that this well-known firm had at the St. Louis Exposition. A full line of stiff mud and dry press machinery was shown in models. W. W. Reehl, the manager; L. W. Penfield of Willoughby, Ohio, and G. C. Stoll of Wheaton, Ill., had charge of the exhibit. Many catalogues and memorandum books were disposed of.

H. M. Hammer was the next to exhibit. He represented the Reliance Machine & Tool Works of St. Louis, Mo., a new "Richmond in the field" for a share of your trade in dry press machinery. Already they have several plants in operation. Mr. Hammer exhibited a model, under belt, that attracted much attention.

The Ohio Ceramic Engineering Co., Cleveland, Ohio, had small models of their railway equipment and were represented by Frank H. Robinson and Lloyd Brown. Catalogues and booklets with valuable information were given away.

L. W. Penfield, Chairman Executive Committee, Willoughby, Ohio.

F. F. Bentley, the president of the Ohio Galvanizing & Mfg. Co., Niles, Ohio, had two tables full of the different kinds of galvanized iron and steel pallets that this firm manufactures.

C. & A. Potts of Indianapolis, Ind., builders of the celebrated Potts soft mud brick machines, was ably represented by Albert Potts. Catalogues and such information as Mr. Potts could give were free for the asking.

W. A. Eudaly, Cincinnati, Ohio, had his usual plans of kilns on the walls adjoining his space and seemed to let them take care of themselves.

The last exhibit on the outer sides of the hall was that of the "Clay Worker" of Indianapolis, Ind. Mr. Billingsley was in charge.

The first of the inside row of exhibitors was the C. W. Raymond Co., Dayton, Ohio. This exhibit was only of folders. Either C. W. Raymond, the president of the company, or C. H. Wilson, their southern agent, was always around and remembered the "boys" with a very pretty match-safe.

John C. Boss, Elkhart, Ind., owner and patentee of the Boss system of kilns, was ever ready to tell about his kilns and keep the brickmakers enlightened on this subject.

W. C. Mitchell, Edwardsville, Ill., displayed his new red catalogue of kilns, blowers and dryers and gave to those that were interested much information on the subject.

W. A. Scentleberry exhibited for Arthur Koppel, 68 Broad St., New York, models of industrial railways of all kinds. His exhibit was very attractive indeed.

James P. Martin, a representative of the Henry Martin Brick Machine Mfg. Co., of Lancaster, Pa., came in for much praise. He furnished to the public catalogues of a full line of clay-working machinery; also hat cleaners by the score.

Bechtel Bros., Waterloo, Ontario, were represented by B. E. Bechtel and C. H. Bechtel. These gentlemen were both kept busy telling about the perfect carless dryer and other machinery that the firm manufactures.

Geo. W. Balkwill, manager of the Semisteel Co., Cleveland, Ohio, had his little exhibit of folders telling about sand-lime brick, and gave his pleasant smile to old friends.

Paul Forwerg, the engineer for the New York Blower Co., Chicago, Ill., was much in evidence and got around among the manufacturers with his catalogues.

The Main Belting Co., Chicago, Ill., was represented by F. S. Thompson, the manager, and E. P. Foster. Samples of all kinds of belting for brick-makers were taken away.

H. H. Fate, the president of the J. D. Fate Co., Plymouth, Ohio, was making himself happy by giving away paper cutters and telling all about the Bensing cutter and stiff mud brick machines.

The National Roofing Co., Tonawanda, N. Y., had their most efficient representative, J. A. Lambert, there early and late, and samples of roofing were seen in many pockets.

One of the most interesting exhibits at the convention was that of the Hauser Co. of Chicago. F. E. Woodford and C. G. Obenland were in charge. It was an automatic electric handling system for handling the clay from the steam shovel or pit to the machine. A crowd was about this exhibit at all times.

W. N. Durbin, Executive Commitiee, Anderson, Ind.

B. E. Place and Herbert H. Freese were distributing pocketbooks, matchsafes and catalogues for E. M. Freese & Co. of Galion, Ohio.

J. A. Crowell represented J. B. Crowell & Son, Wallkill, N. Y., and had full-sized mold boxes on exhibition.

A. Leschen & Sons' Rope Co., St. Louis, Mo., had their representative, L. D. May, showing the value of rope for power transmission and other uses.

Walter P. Grath, the manager of the Illinois Supply & Construction Company, St. Louis, exhibited some new models of dry press brick machines and shingle tile presses.

The Fernholtz Brick Machinery Co., St. Louis, Mo., was very ably represented by Eben Rogers, who never failed to put one of their catalogues where it would do good.

The Horton Mfg. Company, Painesville, Ohio, was represented by F. W. Aldrich.

Gustave J. Hull was the representative of a new dryer concern called the American Dryer Co., Knoxville, Tenn. Mr. Hull is well known to the clay trade.

THE TESTING OF CLAY.*

By Prof. Edward Orton, Jr., Columbus, O.

(Continued from last issue, page 29.)

The Test Kiln.

This brings me to another matter, viz.: the test kiln problem. We cannot consider clay testing without considering this necessary feature of it, for in order to arrive at results we must burn our clays, and we must use the test kiln.

The test kiln really constitutes one of the most troublesome problems in the whole subject. The points of difference between the test kilns and the larger kilns used in the regular industries are chiefly as follows: First, the time of burning a charge of ware is so greatly shortened in the test kiln. Second, the composition of the kiln atmosphere as maintained in the test kiln is quite widely different from that maintained in the large kiln. Third, it is impossible to cool the test kiln as slowly and deliberately as large kilns are cooled, and this influences the color of the product, as well as its strength and toughness. Fourth, in dealing with the small quantity of clay in the test kiln, we do not get the same effect which the great mass of clay produces in the large kiln. Test kiln burning may, therefore, be easier or much more difficult than regular burning according to the nature of the clay to be tested, and its results will at one time need to be discounted and at another time greatly enhanced, to arrive at a just estimate of what the clay will do in regular practice.

The natural tendency of all clay testers would be to have their trials fired in large kilns, and save themselves the irregularities of the test kiln, if it were possible to secure the opportunity. A moment's consideration will show anyone that it is not feasible for a chemist to depend upon burning clay tests at random among full size kilns in use. The difficulty in finding kilns that are suitable; the difficulty of gaining opportunity to have your ware placed in them; the difficulty of seeing that it is not mistreated by some malicious or meddlesome person, who might have some reason for desiring to have the test result unfavorably, and finally, the difficulty of securing the mass effect before alluded to, where a large kiln is burning one kind of ware, and it is desired to test a small quantity of another kind in it—all of these things, and others, make it well-nigh impossible to depend upon the use of large kilns in clay testing. In occasional instances it is quite possible to do so with good results. Where an individual clayworker is testing some clay for use in his own factory and where the temperature and treatment of the ware are exactly what he expects to maintain, it is an easy matter to put in tests from time to time, and give them the exact kiln conditions which they need. Where this can be done, the testing is the most satisfactory which we can possibly reach, but such conditions are almost never attainable by the commercial clay tester. He is, therefore, reluctantly obliged to reject the big kiln idea, or, if he adopts it, his troubles in explaining the problems which arise will be fully as great as if he depended upon the small test kiln instead.

One of the worst difficulties one has to encounter in burning test pieces in large kilns is the tendency of the latter to give results of fictitious excellence. The clay which might give very great trouble in practical working, when burning in large masses at a time, might give beautiful results when burning in small quantities in a large kiln, under more favorable circumstances than could be given it in the usual way. Few clayworkers apparently consider this point, and if they secure a beautiful test piece from a large kiln, they immediately seem to think that they can duplicate it on the large scale in kilns of their own.

When we come to deal with the other end of the dilemma, viz.: the test kiln, we find that no single kiln has yet been devised which meets the varied wants of the clay tester. Kilns of at least two different types are necessary to an effective clay testing plant. One of these must be designed to give a wide range of temperatures in one firing. This is very easily secured, for in all kilns the temperature tends to drop away rapidly as we leave the proximity of the fire. The difficulty is encountered when we try to make a kiln which gives a uniform temperature over a considerable area. By firing up to any given maximum at the hottest point, it is possible to place a series of test pieces at regularly lower temperatures by placing them at regularly increasing distances from the point of greatest temperature. In dealing with an entirely unknown clay, it is convenient to burn the kiln until the temperature at the hottest point reaches cone 10, having placed test pieces at points where cone 5, cone 1, cone 05, cone 010 will be obtained. In a vertical shaft kiln these test pieces are placed at various levels above the grate bars. By a few preliminary burns we can find out what any given kiln will do at any level, if the maximum temperature reached is the same each burn. To find out what the clay will do at all these different temperatures, it is then easy; in other words, we establish its heat range. And, also, while the kiln is in process of heating up we can repeatedly draw trials to see how the oxidation is progressing and thus determine whether the temperature is rising too fast or not.

Such a test kiln answers the ordinary purposes of determining oxidation and vitrification behavior of clays very well. Its weakness lies in its failure to produce the same colors which the clay would naturally produce when burnt in large kilns under the conditions which prevail there; so that the product of the test kiln may seem very unpromising, judging from the test pieces, while, as a matter of fact, the clay may be capable of giving very beautiful effects. But after we have found out for any given clay what temperature is needed to develop its best qualities, we cannot use the same test kiln for making a more conclusive test of the clay at this temperature, for there is apt to be no sufficient area of uniform temperature anywhere in it. For this purpose we need a kiln containing a chamber of moderate size, capable of holding a small quantity of ware of the same size that the prospective commercial product will be, and which can be heated uniformly in every part to the same temperature. If the clay is to be tested for face brick, we should make face brick of it, and judge of its excellence by pieces of the full size. Similarly for paving brick. For sewer pipe this is not necessary, because, as a rule, samples of small diameter, say three or four inches, and one-half or one-fourth of the normal length, can be made to show much the same behavior as the full sized ones, by weighting them as heavily as the pipes in a sewer pipe kiln are weighted when they occupy the lowest position in a stand. Roofing tile should be burned in full size, also the ordinary forms of pottery. There is a great risk by misjudging results when one attempts to say what the defects of a large piece will be, when judging from a small one. For this reason, no final test of a clay should depend upon trial pieces of small size, except possibly in the case of refractory materials. In this industry, the fusion or breaking down of the clay is a chemical problem more than a mechanical one, and the chemical behavior can be ascertained about as well on a small piece as on a larger one. The difficulty and expense of obtaining temperature sufficient to melt a full-sized fire brick are so great that it is customary to make fusion tests on very small quantities, accurately sampled to fairly represent the whole.

The second test kiln should, therefore, be so constructed that a uniform temperature may be secured in the entire kiln chamber. In some cases it is desirable that this chamber be converted into a muffle; in others, it should be left open for the passage of the flames through the ware. It should be constructed so that the interior space may be used in any desired way, and that the construction of muffles, etc., inside it, could be done with the minimum of trouble. The firing arrangements and draft should be so designed that the burner will have perfect control of them and can raise or lower the temperature of any part of the kiln practically at will. It is needless to say that this form of test kiln is not an easy one to construct. Of all the dozens that I have seen, and of the many which I have personally constructed and used, I cannot honestly say that I have ever seen one which is wholly satisfactory. But there are great differences in them, however. Some are much worse than others.

If one has succeeded in constructing for himself a pair of test kilns, one adjusted to producing a wide heat range and the other for producing an even temperature throughout its interior, he is then in position to make ordinary clay tests as well as they can be made. For testing high grade fire clays, still another furnace must be provided.

Returning at this point to the subject of oxidation, it is necessary in studying the burning behavior of a new clay to provide a considerable number of test pieces which may be placed at different levels in the kiln, so that they may be withdrawn freely at different times and still leave a sufficient number to go through the burn to the end. Ordinarily, one does not require more than six or eight draw trials to determine the nature of the oxidation behavior. But clays have occasionally been met which have resisted oxidation for a period three to five times as long as in normal clays. I have occasionally used my entire supply of clay in experimenting, without obtaining a single perfectly oxidized piece. Of course, it could be reported in this case that the clay offered such difficulties in oxidation that it would be undesirable for use in any clayworking industry. Nevertheless, it was a source of dissatisfaction to be unable to show definitely what the material would be, if it were carried through a successful burn. One point should be observed in oxidation trials, viz.: that the oxidation should be confined to low temperatures. The color of the clay is almost sure to receive a permanent damage if the temperature is allowed to go beyond 850° C. and it is much safer, therefore, to keep the temperature down to low red heat until your draw trials show perfect oxidation.

Clays vary very widely in their behavior during the final hardening or vitrification process. These differences affect the clay's value in two ways. First, by affecting the nature of the best product obtainable; and second, by affecting the difficulty of obtaining it.

The Vitrification Test.

Some clays proceed quietly through the temperature changes with scarcely any visible effects until all at once their critical point is reached. Then they shrink, harden and fuse with startling rapidity. Such clays are treacherous and unprofitable to work, because one is compelled to get perilously close to the fusing point in order to secure commercial hardness. Other clays pass gradually with increasing hardness from stage to stage and do not manifest any wide difference in structure between any two stages. Even in clays of this nature there is great difference, because the vitrification of one may run through a temperature range of five cones while another one may perhaps run through fifteen cones without being actually ruined by over-burning. It is evident that if a clay product may be given a heat range of several cones, and still be commercially excellent, that the chances of making money by its manufacture are enormously increased. The soft material at the cold part of the kiln, and the hard material at the hot part of the kiln, will each still be merchantable, and will not vary very widely from the best material at those parts of the kiln where the temperature was average. In other words, the entire output of the kiln can be disposed of.

On the other hand, if we are dealing with a clay of low vitrification range, we are certain to have both underburned and over-fired material in each kiln. If over-burned, it is either rejected altogether, or must be sold at a sacrifice, or must be re-fired in the hope of getting it out again in better condition and of commercial grade. Re-firing, of course, costs money, and there are few common clay products on which one can afford to spend this extra cost and still make profits. The width of this temperature range is, therefore, one of the important points to develop in clay testing, and it is one which defies any prophecies based on merely practical experience. One cannot tell from the appearance of clay, or its geological age and occurrence, or the way it works, whether or not it will be satisfactory in this respect. As a general rule, very fine-grained clays vitrify more rapidly than coarse ones. But all these considerations make this generalization of little value.

If a number of trial pieces be placed in the kiln and subjected to a wide range of temperatures for vitrification, and then allowed to cool with the kiln, and withdrawn only after they have reached the atmospheric temperature again, one is able to see what the heat range of the clay is. For instance, if one finds that at 010, the clay has not begun to harden, and that at 05 it is still soft, though hard enough for common brick, and that at a cone 5, it is a hard paving brick, inclining to brittleness, and at a cone 10 it has swollen up to a puffy cinder, we have data before us from which we can confidently predict that this clay has a heat range from cone 02 to 6, and that it is favorable to a large yield of a marketable grade. This heat range amounts to about 250° F., and it would surely seem that any kiln ought to be controlled within such wide limits as this. If, on the other hand, our draw trials show no perceptible change between cones 010, 05 and 1, and show at cone 5 a bubbled, cindery mass, then it would be apparent that somewhere between cone 1 and 5 this clay reached a sudden maturity, and passed beyond it into fusion, and if one were wise he would avoid establishing a clay plant upon any such raw material.

From the foregoing rough illustration you will see that a practical estimate of the value of a clay by burning is possible by following the lines laid down.

The Qualities Developed in Clay by Burning.

The properties which characterize burned clays cover an exceedingly wide range, so wide, in fact, that it is not possible to lay down their limits with the decision or detail which has been possible in the two preceding sections on the raw properties and burning. We burn clays to produce wares for such exceedingly different purposes that the qualities which recommend a clay for one use would condemn it for another. One ware must be vitrified, another must nearly melt, another must not melt at all; one must be opaque, another must be translucent; one must be tough and elastic, another must be brittle; one must have a coarse, open structure, another would be fatally damaged by such structure, and so on. So that it is necessary in clay testing to know in advance for what purpose a clay is to be used, in order to reach conclusions of importance. When you are approached with the request to test a clay and see what it is good for, it is impossible to meet the demand at what people think a reasonable cost because there are so many uses to which it might be put, and each would require a special examination by itself.

Color.

There are some qualities about which a few general truths may be stated. The first of these qualities of wide general importance is the color. A large class of clay wares depends principally on their color for their value. This is true to a considerable extent of common brick. It is the least true of common brick made and sold in large cities, because here they are chiefly used in interior walls and for backing up, so that the brick are not seen, and their appearance is therefore unimportant. But the common brick of small towns and cities is the surface material of the structure, and its appearance is therefore important. For face brick, roofing tile, terra cotta, and many other clay products, the color is of the very greatest importance. In the burning process which has just been described, it has been made clear that the test kiln is imperfect in this respect. If we draw a clay trial from a kiln which is at its maximum temperature, it will possess none of the characteristics which mark the clay when cooled normally. But of all the qualities thus disarranged, the color and toughness are most affected. Therefore, the first requirement is that some test pieces must be permitted to remain in the kiln at the end of the burn, so that they may cool down with the kiln to the atmospheric temperature. These test pieces will give us some indication of what the color of the clay would be at the various temperatures which they represent, but after all they are very unreliable. We find that it is impossible to produce the same color in a small kiln containing a few pieces that we can easily get in a large kiln containing thousands of pieces. In the case of a clay burning to a pure, white color, there would be no difference, and in case of the clay burning a fine bright red there might be little difference. But where there is one clay whose color is unaltered by such treatment, i. e., variations of time and temperature and cooling, there are a hundred that are not, so that we must always accept the color developed by a test kiln with much reserve.

In general, the color developed is worse than that we can expect to achieve in practice. For instance, in burning face brick in an open test kiln, one almost invariably flashes or flame marks the brick more or less. A large kiln should avoid this. Also if one be making flash brick in the test kiln, he cannot often secure the warmth and brilliancy of flash which a large kiln readily generates. On the other hand, if one is burning face brick in a muffle test kiln, he may perhaps secure a very even beautiful color, as good, in fact, as could be got in a large kiln, where the brick are not set in a muffle. So that one cannot always insist that the results of the test shall be got by the same methods of burning which it will be called on to undergo; it is much more likely that the idea obtained by different methods may lead us nearer the truth. The greatest discrimination is required in reaching such conclusions.

In general, one cannot secure a beautiful color in the test kiln by any process, whether the test pieces be screened from the influence of the flames or exposed to them. One can often say as the result of the test kiln burns, that a clay will give a good color under commercial conditions; but, on the other hand, if one gets a bad color in test kiln treatment, no matter how careful he is, nor how many treatments he tries, there is always the possibility that under the conditions of the large kiln the color might be very much better. The reason for this is the mass effect to which allusion has been made. For instance, the emanations from fifty thousand or one hundred thousand brick containing carbon and sulphur, powerfully affect the atmosphere of the kiln for hours at a time, and leave an indelible effect on the ware in consequence. But when we burn a half dozen of such brick in the test kiln the emanation of these brick bears such a small proportion to the volume of hot air passing through the kiln that its effect on the brick becomes reduced to an indistinguishable trifle. We may obtain in the first case a beautiful golden brown or iron rust color, while only a dirty buff would be reached in the second case. The testing process must be acknowledged, therefore, as less satisfactory in respect to color than in any other respect.

Shrinkage.

Another property of great importance in all cases is the shrinkage. We have discussed this in connection with the raw clay, but the shrinkage in burning is entirely separate from that produced by plasticity. The measurement of the burning shrinkage is a simple process, the method of which is the same as the drying shrinkage. But we need to know what this shrinkage is at a number of different temperatures rather than at one particular temperature. Some clays shrink rapidly, others do not. In some the fire shrinkage is very great, in others very little, so that the shrinkage data of the clay should be tabulated, showing that out of 100 per cent total shrinkage, what part belongs to the drying, and what part to each cone temperature at which trial pieces were measured. If these series show a regular, constant change in volume, we have the best evidence that this clay will not give trouble in the way of fire cracks, warping and twisting. On the other hand, if we find the clay shrinks suddenly or excessively at any point in the burning, then we must look out for unprofitable operations. The difference in this respect in different industries is very great. For instance, a paving brickmaker expects great shrinkage, while a silica brickmaker expects none. The use of the product will determine these things in advance.

The Toughness.

The toughness is one of the most difficult properties to measure of any we have to deal with, because, like plasticity, it is not a simple property. It is the resultant of two or more properties. Elasticity on the one side and hardness on the other are the two properties which are supposed to control that indefinable thing which we call toughness. For instance, if a substance be hard and not elastic, and breaks readily under a blow, we call it brittle. On the other hand, if a substance be soft and very elastic, like rubber, we call it tough. The toughness of a clay ware, which is designed to stand friction or wear or blows, is not like that of rubber, nor is its brittleness like that of ice. It must stand between these in both respects. It must have sufficient hardness to resist penetration and sufficient elasticity to avoid shattering from the blows that come its way. The paving brick is par excellence an example of this quality.

No one can prophesy what the toughness of clay will be. Some clays give every promise of toughness, but when burned are found to wear away rapidly. Others stand an incredible amount of wear and pounding before they crumble down.

The method of testing toughness of clay wares is by the so-called abrasion test. The standard paving brick test of this association is an abrasion test; similar tests have to be made for all sorts of materials. For instance, china plates may be tested by abrasion as well as paving brick. You have all seen the abrasive qualities of plates pretty well tested in watching the table service at a modern American hotel. But when rival manufacturers want to determine which is making the best ware, they need a process which admits of a more definite numerical result than the hotel method. If we break up a set of plates into inch-square pieces, carefully selecting pieces of the same thickness in order that the two brands may be fairly compared, and then put them into a cylinder with a sufficient quantity of porcelain pebbles to act as the wearing agent, we can very soon tell which variety has the property of toughness developed to the greatest degree. A rattler must therefore be adjusted according to the work it is called upon to do. In testing brick we use a 30-in. cylinder, and in it put 300 lbs. of iron and steel shot, in order to make the test severe enough. In testing china dinner plates, we perhaps might use a 12-in.

cylinder with 10 lbs. of porcelain marbles, about ⅞-in. in diameter, and these conditions would be just as severe in proportion as the paving brick test.

By controlling the diameter of the cylinder, the speed of rotation, the duration of the test, the weight of the abrasive charge, the size of the pieces composing the abrasive charge, and possibly a few other factors, we can devise a rattler or abrasion test which will develop this quality of toughness in any commercial material. It is necessary in compounding the charge for any test to use two sizes of abrasives. The large ones strike the heavy blows, and test the brittleness, and the small ones scour and rub the surface to wear it away. If we make our charge consist of small pebbles only, the action is not sufficiently energetic; if all large pebbles, the machine acts as a ball mill or crusher. Skill in devising the test, therefore, hinges on the compounding of a charge which will make the severity of the test exactly suited to the material. This requires some practice, but is, after all, a simple mechanical matter.

Absorption.

This quality is of importance, as reflecting upon the ability of the material to withstand weather. A large majority of clay products are exposed to outside weather, and they naturally absorb moisture during the fall of rain and snow and lose it by evaporation into the air again under fair weather conditions. If a sudden fall of temperature occurs while clay wares are freshly soaked full of water, the expansive force of the ice in freezing produces a terrific strain on the clay, and if its strength be poor, a certain amount of strain disrupts it. In fact, no clay ware can resist the bursting action of frost if water is allowed to collect in large masses in it. Many clay wares of a porous nature, seemingly quite weak, manage to resist freezing and thawing in winter. The secret of their ability will be found not so much in their strength as in the even distribution of the water throughout the mass, so that the pressure created in one part to a certain extent, is equalized by the corresponding pressure elsewhere. Further, clay must be of such a structure that under the influence of this pressure the ice can be expelled through the pore system, and thus make room for the additional volume required. Clay products of a highly vitrified nature frequently burst by frost on account of flaws or cavities large enough to contain considerable water at once. No matter how hard or non-porous the clay may be, the action of an accumulation of water in one spot will break it down, and, on the other hand, clay wares have sometimes been found which would successfully resist freezing while showing an absorption of 20 per cent. The absorption test, therefore, is one which needs very careful interpretation. In some industries it is of no importance whatever, and often where it is admitted to be of general importance, the process by which the clay is manufactured and the evenness or homogeneity of the material will have more to do with its resisting weather than the actual cohesion of its clay grains. There are a number of factors connected with the absorption test which are frequently required; for instance, the specific gravity, and the porosity tests. These are not in themselves very accurate or convincing demonstrations of the volume of the clay, but their chief merit lies in the readiness with which they throw light on the behavior in freezing.

The number of other tests that could be considered in this connection is still great, but it is thought enough has now been said to show the point of view of the writer in regard to the subject of clay testing. It is possible by following out the simple routine method herein described to attain in a short time, with comparatively little labor, a very fair idea of the value of a clay. It is not possible by so small an expenditure of labor and money to secure equally valuable data by any other method. The practical conclusions to be reached as a result of these considerations is that clayworkers and investors in the clay industry should learn for themselves the value of these simple tests, and instead of asking for chemical analyses they should first make for themselves or have made a practical test. If a chemical test is needed ultimately to explain the cause of trouble arising, it is, of course, proper to use it for this purpose.

As long as the conditions remain as they are, chemists will still continue to make analyses of clay, and clayworkers will still continue to be disgusted with the results. This paper has been written with the view to lead both parties, clayworkers and chemists, to a fuller realization of the facts in the case. If it has been successful in any degree, the labor in preparing it has been well spent.

FIGURES OF PURINGTON PAVING BRICK WORKS FOR LAST YEAR WILL PROVE REVELATION.

The announcement that the Purington Paving Brick Company had increased its capital stock from $750,000 to $1,000,000 was read with delight by those who have the interest of the city and her industries at heart and all welcomed the advent of a million dollar industry to the city.

One of the officers of the company, said that the decision to increase the capital stock was made at the recent meeting of the stockholders, but at the present time the company is not prepared to give out why the increase was made.

The growth of this company has been most phenomenal. It came here about fifteen years ago with a capital stock perhaps one-fifth what it is now. Soon after the coming here and the building of a yard in that vicinity by a St. Louis company the latter company was bought out and the capital increased to $500,000. Last April the Galesburg Paving Brick Company was absorbed and the capital increased to $750,000. Now, a year later, another quarter of a million is added.

The immensity of the plant—which by the way, is the largest one of its kind in the world—can be somewhat judged by a few figures. During the year just passed the company paid out in wages to its workmen alone $285,000 and used 117,842 tons of coal and slack in burning the bricks and running the yards. The average number of men employed is between 500 and 529, the largest number ever being employed at one time being 549. Other figures which show the growth of the concern are those which show the number of bricks shipped in the past ten years, as follows:

In 1895	20,880,000
In 1896	22,630,300
In 1897	23,100,000
In 1898	24,720,000
In 1899	38,280,000
In 1900	49,675,000
In 1901	52,432,000
In 1902	60,500.000
In 1903	65,092,000
In 1904	76,286,800

In connection with the vast amount of bricks turned out last year the yards have undergone a general overhauling, entailing an expense of in the neighborhood of $40,000. New boilers have been installed in three of the yards; new dryer cars have been placed in service; the company is now carrying its own fire insurance and to this end a complete water works plant with hydrants, etc., has been installed in all the yards and flame proof walls have taken the place of the old ones; a railroad has been built between yards 1 and 4, and an engine owned by the company hauls the cars; a steam shovel digs the clay for three of the yards; an electric light plant has been installed which gives light and power to all the yards; besides other improvements which have made the yards almost new.

THE GOOD ROADS MOVEMENT AND THE PART PAVING BRICK SHOULD HAVE IN IT.*

By R. W. Richardson.

You are to be congratulated upon giving recognition to the subject of highway improvement by assigning it an especial part in your proceedings, and I am grateful for the honor of presenting it.

The Common Road.

I know of no subject so closely and intimately related to all our domestic and public affairs as the common road. Over it is transported the product of the field, the forest and the mine. It brings to us our daily needs and carries to the consumer the output of the factory and store. It is at the base of our commercial and material prosperity. It leads to the school, the church and the home. It is the common property of all. The business man and the farmer, professional man and the laborer, the artist and the artisan, saint and sinner, man, woman and child, maid and matron, young and old, rich and poor, healthy and sick, the lame, the halt and the blind, all get a share of benefit from a good road. It is a mark of progress in the community, a generator and radiator of blessings to all who live upon it, or who move upon it. It adds value to lands and property, regulates trade for the merchant, steady run for the factory and is an equalizer of traffic on railways and water-ways.

It is the most domestic of all public institutions. It guarantees more for the freedom and independence of the people than any other public improvement.

Our public roads should have our first consideration; they have our last. They should have the best attention; they get the worst. They should be the concern of all; they are left to the indifferent care of the few.

Our country can boast of its progress in everything save in its public roads. Ninety-five per cent of the common road mileage of this country is unimproved, practically in the same condition, except some temporary improvement each year, as a half century or more ago.

The Good Roads Movement.

The present good roads movement has for its mission the revolutionizing of road methods and management. It recognizes that the present manner of managing road affairs in all the states, except a few in the eastern portion, will never provide an adequate system of permanent public roads; that more than a hundred years of experience has demonstrated this truth; that the countries from which we inherited our present methods were forced to abandon them in order to secure a system of permanent public highways. The present system is wrong in principle and practice. It lays the burden upon the few for the benefit of the many. It is wasteful, without business management or intelligent supervision and without permanent betterments as results. This movement endeavors to dignify the subject and urge its necessities upon the commercial and industrial as well as upon the agricultural interests. By some strange analysis and long custom road matters are left almost wholly to the people in the country districts. The cities and towns, although they garner the wealth from the farm and country, depend upon them for their food supply and to maintain their several crafts, trades and professions, still conceive that they have no concern for the public road or street, after it passes the town or city limits. The farmer or rural inhabitant, on the other hand, has grown into the idea that he has a private ownership in the public highways, that he has the sole right of their control and management. He is jealous of any interference on the part of the town people or the general public. He has a false fear that to even suggest their permanent improvement would be interfering with his property rights and lay a burden upon his lands. The farmer or the abutting land owner or the inhabitant of the rural district has no more sovereignty, right of user in or upon the public road than the man in the city or town or in a foreign state or country. It is not strange that the farmer should be apprehensive of any proposition to build what might be judged expensive permanent roads. The custom, so long in use, of laying upon the lands and abutting property, along the highway, the entire burden of its cost and maintenance is unjust and unfair. It is placing the burden of a general public improvement, for the use and benefit of all, upon the property of a few. The farmer should bear his proportion and no more. The merchant and tradesman, manufacturer and artisan, the bankers and the professional men, transportation companies and corporations who are equally benefited by this internal improvement should share in its cost and the responsibilities of its management. The common road is the property of all, for the use of all, for the benefit of all, and its cost should be shared equitably by all. The present movement is giving emphasis to this modern principle. It is appealing to the commercial and industrial interests of the country, urging them to awake to their relations and duties in the premises. It is certain that we will never provide a system of permanent roads until these interests recognize their responsibilities and take the initiative to secure them.

It is my experience after four years of active service in behalf of this cause that it is useless to hope for any permanent improvement in the public roads unless the business men demand it and are active for it. The farmer, as a rule, is in the rut and mud of the ages and must have a quickening, forceful leadership.

National and State Aid.

The countries of Europe, which have and maintain splendid systems of public roads, the admiration of the American traveler, have secured them by abolishing the system of depending upon the local districts and providing for their construction and maintenance by the general government. There is a strong and growing sentiment in this country favorable to the national government lending aid in the construction of national, interstate and postal roads. There is a time-honored and shelf-worn theory in our government, called into action principally for opposition purposes, that the state is sovereign and exclusive in matters of internal improvement within their several jurisdictions. Therefore, for the present, at least, we must look to the states for a system of permanent public roads. Some of the states, notably New

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*Read at the Birmingham meeting of N. B. M. A., February, 1905.

Jersey, Massachusetts, New York and Connecticut, have applied the modern principle of state aid, supervision and equitable distribution of cost and are making rapid progress in road building and extension. They have demonstrated the practicability of this plan, and it is commanding increased favor with each succeeding year. It is the solution of the road problem for the states.

While there is some advancement each year in permanent road making in local districts, which is not to be discouraged, and a substantial sentiment abroad in the land for this necessary improvement, there yet remains so much to be done that it reminds us of the reply of an Irishman who was hauling water up out of a river. Some one on meeting him with his load said, "Pat, how much water have you hauled up?" He said, "All but what you see below there in the river." Viewing then this gigantic task, the necessity for strong advocates and substantial supporters for its accomplishment, we return to our subject to inquire as to the part the brick industry should play in it.

Brick Roads.

The first paving bricks were made by the direct descendants of Noah on the plain of Shinar. The book of Genesis tells us that they said to one another, "Go to, let us make brick and burn them thoroughly." This would indicate that they made a very good article of paving brick. They paved a highway leading from Babylon to Memphis, and along it arose the great commercial cities of Ninevah, Palmyra, Damascus, Tyre and Antioch. No doubt brick was used for paving by the Isrealites and the Egyptians, although no special mention is made of it. The ancients regarded brickmaking as the greatest of their arts. On one of the great pyramids built of brick is found this inscription:

"Do not undervalue me by comparing me with pyramids of stone, for I am better than they as Jove exceeds the other Deities." The Greeks and the Romans understood the science and art of making brick, as their palaces, temples, baths, and ancient walls still witness. In modern times Holland seems to be the first to use brick in the construction of her highways. She utilizes her dikes for roads, paves them with brick called "klinkers," because they ring when knocked together. She has built a brick road from Utrecht to Connigham. What the Dutch have done for Holland, with her deep alluvial soil and without natural road material, the people of the Mississippi Valley may do, or any others who have the requisite energy and population. It seems that the first brick street or road in the United States was laid in Charleston, W. Va., in 1872, and from it has evolved the great industry of brick pavement in many of our cities and towns.

The use of brick in road construction has been limited. You hear very little said, as a general rule, about the use of brick for country roads. They are not considered as a practical road material. This arises from lack of knowledge of their merits. I suppose our brickmakers have been absorbed in other departments of their industry and have failed to demonstrate to and impress upon the public the superior qualities of vitrified paving brick for country highways.

Experiments in Brick Road Building.

Some experiments have been made in brick roads in this country which illustrate the advantage of brick over other material and demonstrate their practical use for the purpose of road making.

The most notable of these was made at Monmouth, Warren County, Ill. About ten years ago City Engineer Miller conceived the idea of combining stone macadam foundation with a brick surface for country roads. The experiment has proved most satisfactory, and Monmouth is justly proud of her excellent system of brick roads.

Method of Construction.

The specifications followed in the construction of these roads is to bring the proposed roadway to the proper grade. The sub-grade underdrained at low or flat places with a 6-in. tile in the center and a 4-in. tile on each side. The foundation is then cut out in the same manner as in the building of macadam roads and thoroughly rolled with a 10-ton steam roller. It is given a crown of about 3 in. from the center to the sides. A curb consisting of plain pine boards 1 x 6 in. is placed on the edge on the sides. The first course is then laid of crushed lime-stone to the depth of 4 to 6 in. after compact, as the character of the road, estimated by the weight of traffic, requires. For this coarse gravel, broken sewer pipe, slag, roled down to the requisite depth and sloping to the outer line. This berm or shoulder not only supports the be properly laid, bonded and rolled. Upon this is placed the usual cushion of sand about 2 in. in thickness, properly spread, shaped and tamped in the usual manner. Upon this is laid the regulation size paving brick placed on edge, close together, crosswise of the road, alternating courses, breaking joints and fitted close against the curb, their surface being flush with the top of it. Dry, sharp sand is then spread on to the depth of about a half inch and swept into the voids between the brick, the whole to be then rolled to a uniform surface finish. The wooden curb is flanked or reinforced on the outside with a strip of crushed stone or with gravel or slag, rolled down to the requisite depth and sloping to the outer line. This berm or shoulder not only supports the wooden curb for the brick, but affords an easy approach to the road, enabling vehicles to pass freely on and off the brick road. It also has the effect of widening the hard portion of the road to the width of 14 or 15 ft., the brick wheelway being only 9 or 10 ft. in width. This width is sufficient for all practical purposes. This method of construction may be varied to suit conditions. Concrete might be used in place of sand for filling voids and the sand might be bettered by having a portion of it ground to powder and puddled with the coarse portion. It has been suggested for light traffic roads that the brick might be laid flat-wise, thus making considerable saving in cost.

Cost and Maintenance.

It may be stated that the first cost of brick roads at the present time is a little in excess of macadam roads, but when we consider the question of durability and maintenance with other advantages the economy of the brick road is very pronounced in comparison with the macadam. It is well known from experience that macadam roads constructed of limestone or similar rock, with ordinary traffic and weather conditions, sustain an annual wear and waste of about one-half inch from their surface. This necessitates a considerable outlay for maintenance each year. M. O. Eldridge, of the Office of Road Inquiries of the Government, to whom I am indebted for much of the data herein, states that from personal inspection "the brick roads in the neighborhood of Monmouth, which were built in 1892, show no appreciable signs of wear, although from information given him they have had but little repair since construction." It is said that brick roads in Holland and the Netherlands which have had constant use for more than fifty years are still in good, sound condition.

Advantages of Brick Roads.

The difficulty with the ordinary macadam road, except those surfaced with a special quality of trappean rock, is that they will not endure the resistance of traffic, the action of wind, droughts and torrential rains. The same is true, as a rule, of gravel, chert, slag and shell roads. The combination of paving brick as a surfacing material guarantees durability and cheapness of maintenance. It is practically free from mud and dust, affords footholds for horses on heavy grades and insures ease of traction.

The brick road has particularly the advantage over other roads on the point of traction. It requires 75 per cent more tractive power to draw the same load over a macadam than over a brick road, 188 per cent more to draw the same load over a gravel road, and 381 per cent more to draw it over a dirt road than over a brick road.

Inspiration.

These striking advantages and the actual experiences cited should inspire renewed admiration for the brickmaker's art and extend its usefulness to this neglected field of internal improvement.

Without considering the direct gain to your craft in financial and useful ways, what patriotic satisfaction in the achievement of providing a complete system of roads and highways for your country, made of the best material known to the art of man!

How Can It Be Done?

Granting the truth and force of your statement, we would inquire, how can this be accomplished? What part should the brick industry play in it? Well, it is not so difficult a problem when once you have determined upon it. It is like any other business proposition or purpose that you wish to accomplish. Enter upon it with determination; make a beginning; it will solve itself and bring success. Make the subject of road improvement and its promotion one of the active departments of this association. Establish and maintain a bureau with a competent head and assistants to educate and agitate for brick roads and street pavement. These roads and streets have the merit and will win when properly presented against all competitors. A reasonable sum contributed each year would maintain this bureau and the direct results would greatly exceed your best expectations.

Conclusion.

It was on the plain in the land of Shinar that the Babylonians built their city of brick and reared a tower reaching to the heavens, and this, too, of brick. It is the only art of man that has reached from earth to heaven and called down a visit from the gods to admire its wonderful achievements. The Lord viewed these marvelous feats and the mighty tower of Babel built of dust and slime, fashioned into brick by the skill of man, and decreed that this wonderful and resourceful people should not live selfishly for themselves, but that their art should be spread to the world. He therefore confused their language and tongues, thus forcing them to carry their useful art to the uttermost parts of the earth. I covet now such power that I might confuse your absorbed interest in the other branches of your great industry and send you forth preaching the gospel of better roads. Brick roads, if you will. Bring in closer communion the church, the school, the home, the farm, the factory, the store, the post office, the place of social concourse and amusement, making easier the way for righteousness, contentment and prosperity. Increase the value of our lands, relieving our beasts of burden, regulating our markets, securing the advantages of city life to the rural home and blending the congested life of the city with that of the refreshing influence of the country. Add to our commercial, industrial and agricultural progress, our comfort and pleasure. Embellish and beautify our country and surpass even England and France in the magnificence of our highways.

This is my earnest appeal to the patriotic brick manufacturers of America.

WILL ERECT A PLANT IN NEW YORK WITH A CAPACITY OF 1,000,000 PER DAY.

The directors of the United States Brick Company, elected at last week's meeting in Wilmington, met in the company's offices, Reading, Pa., for organization. Following constitute the Board, and nearly all were present at this meeting: B. Dawson Coleman, of Lebanon, who is also chairman of the Penn'a Steel Co.; Arthur Brock, of Phila., who is also a director of the Penn Mutual Life Insurance Co.; Richmond L. Jones, A. J. Brumbach, Dr. Walter A. Rigg, Robert Brooke, Birdsboro; Jeremiah J. Mohn, John F. Mohn, W. W. Light, A. A. Gery, Howard L. Boas, George T. Valentine, Lambert A. Rehr, Wilson F. Ferguson, Nathaniel Ferguson and John E. Harbster.

The directors elected Albert A. Gery, president; B. Dawson Coleman, vice-president; W. W. Light, treasurer; J. Milton Miller, secretary, and Richmond L. Jones, general counsel.

It was decided to erect an immense plant in New York at a cost of a million and a half dollars. The company has secured options on two sites, both located along the Hudson and having excellent shipping facilities both by rail and boat. Mr. Gery and Mr. Coleman spent a day in New York in consultation with the capitalists who are interested in the plant to be located there, and who will later be represented on the board of directors.

The New York plant will have a capacity of a million brick a day, and the capitalists in it alone control the consumption of at least half a million a day. Operations will be commenced in spring. Before interesting themselves in the enterprise, the New York people sent experts here to inspect the Perkiomen plant on which Mr. Gery holds the patents.

The establishment of plants in Buffalo and Pittsburg will next be taken up.

THE LARGEST BRICK PLANT IN FLORIDA.

The McMillan Brick Company of Pine Barren, Florida, is the largest plant of the kind in the state. The plant has been in existence for fifteen years, but three years ago it was put under the management of Mr. W. P. Brownson, who has been responsible for its prominence in the manufacturing field of Florida.

About $15,000 to $20,000 capital is invested and $5,000.00 annually is spent for fuel alone. The product is sold to points in Alabama and Florida, while a very large export business is done in Mexico by way of Mobile. The quality of the brick is unsurpassed for building purposes, and nearly every prominent lumber company in Florida demands it for use in building their dry kilns. The pits seem to be practically inexhaustible. About fifty men are employed and $2,000 a month is paid out for labor. Ample shipping facilities are afforded by the L. & N. R. R., the switches of the railroad running into the yards of the plant in front of the kilns. The company owns their own switches. At the Pine Barren plant there are about thirty acres, but the company owns yet another plat of 500 acres. In the thirty-acre tract a small portion of it is dug down to about eight feet, yet $30,000 of brick has already been secured from it. There are two acres under the sheds and capable of holding 200,000 brick in process of drying. The kiln capacity is 650,000. The plant takes the slab output of two saw mills, which they use for fuel, all of which is hauled by rail; besides which they contract for hauling wood and also operate their own teams for the same purpose. The yearly shipments of brick from the McMillan Brick Works are at least $30,000.

It is interesting to watch the process of brick making at this plant. As the brick comes out of the die it is as smooth in appearance as marble, free from all pebbles and iron, and with a glistening surface. There is no doubt but this brick is the finest made in the South.

SAND-LIME BRICK IN ANOTHER TEST.

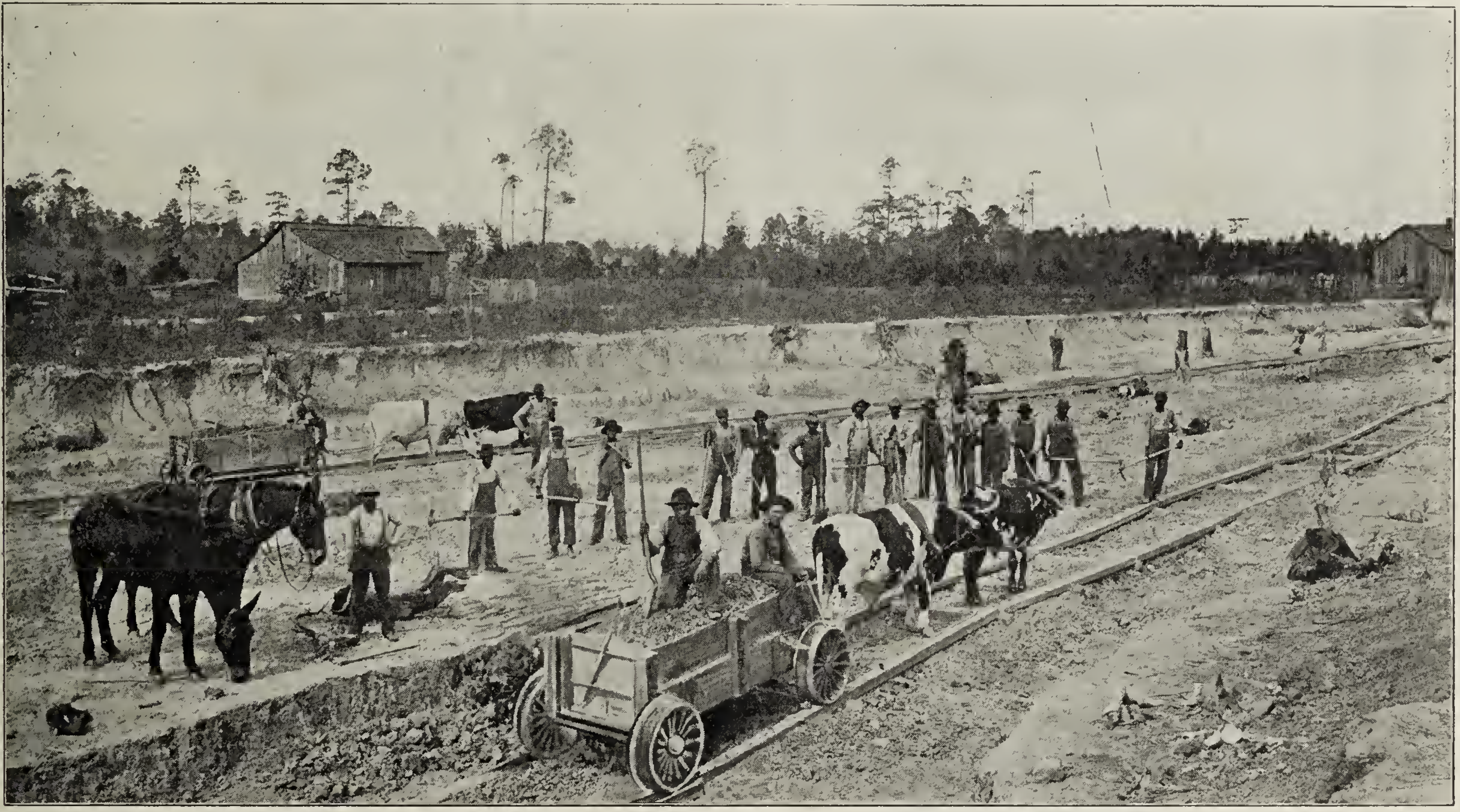
That Manistee, Mich., sand-lime brick were recently submitted to a very severe test, which show them to be as near perfect as brick of any kind, and far ahead of many now made.

In the morning several brick were put to soak. At night it was found they had absorbed 8 per cent of their own weight in water. They were placed out of doors over night and permitted to freeze. The next day they were again taken into the factory, placed in an oven and baked for four hours. During the afternoon they were again allowed to absorb moisture, and at night placed outside for a second freezing. This morning they were heated suddenly and after being dipped into cold water they showed no streaks, cracks or chippings, and were equally as perfect as when first taken from the molds. Struck with a hammer they broke clean and sharp, and appeared as solid as a piece of stone.

Gardner, Peterman & Co., of Onaway, Mich., did not have a sufficiency of fire brick for the completion of an arch in their saw mill, and not desiring to delay the work, completed the arch with sand-lime brick. The most intense heat has been applied to them and they show no worse effects than do the regular firebrick.

A smoke-stack foundation built of sand-lime brick, four feet from the ground to the top of the foundation, was the best illustration of the ability of such brick to withstand alternate heat and cold. The brick had been in ice for two years and were as perfect as when first laid, though they did not possess that tough, brittle surface and interior which is characteristic of the Manistee brick.

The Standard Portland Cement Company believe in the power of sand-lime brick to withstand extremes of heat. They have ordered two carloads for use in the construction of their lime-kilns.

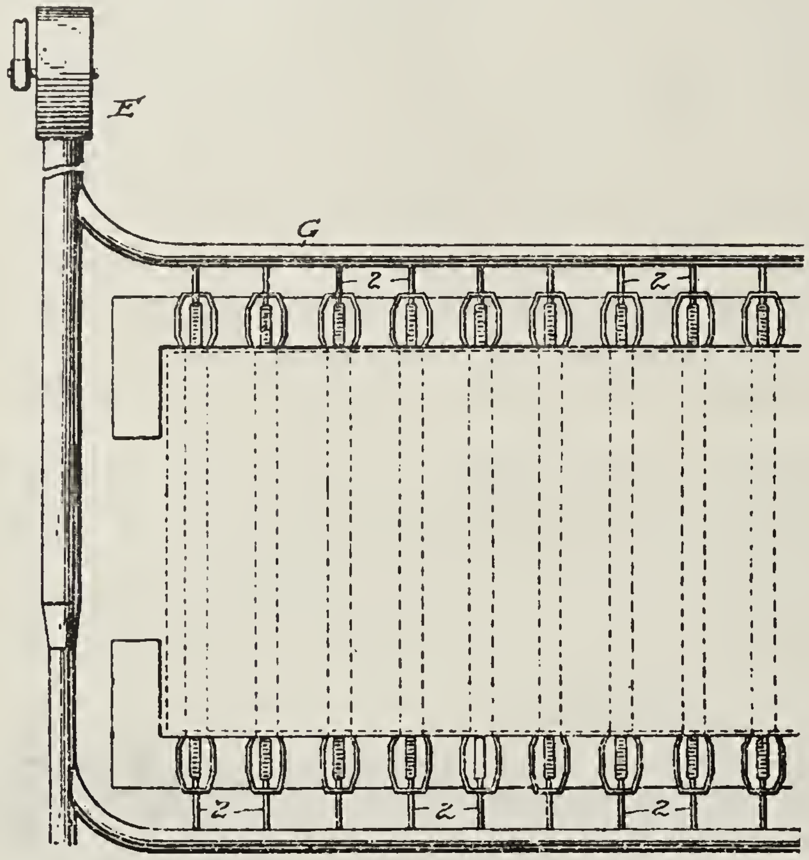


Clay Pit of the McMillan Brick Co. Machinery furnished by American Clay Working Machinery Co.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

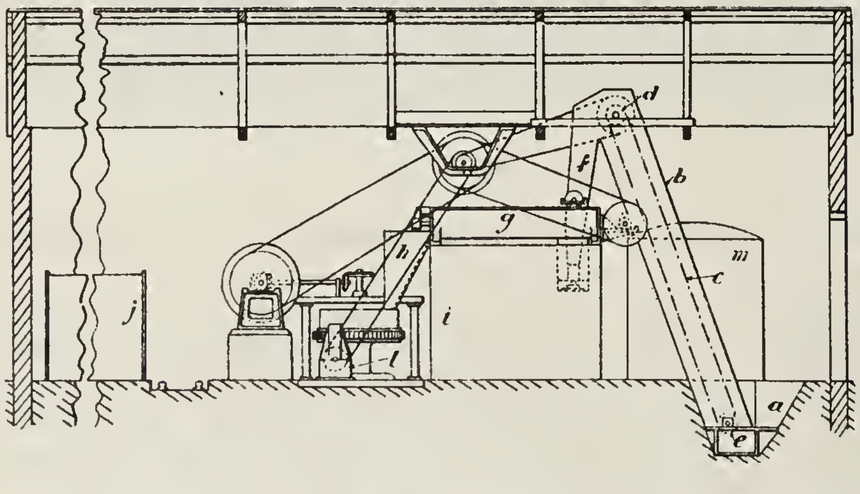
These new inventions are those that are especially of interest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

778,441. Brick-Kiln. John C. Boss, Elkhart, Ind. Filed Jan. 7, 1904. Serial No. 188,135.



Claim.—In combination, in a kiln, the arch, an air-box at the bottom of the arch, the said box being formed of brick, fire-bricks resting on the air-box and slightly separated from each other to provide elongated openings, extending transversely of the arch, and mortar arranged at the ends of the elongated openings and between the fire-bricks, said mortar sloping outwardly from the lower part of the fire-brick to the top to provide flaring discharge-mouths, substantially as described.

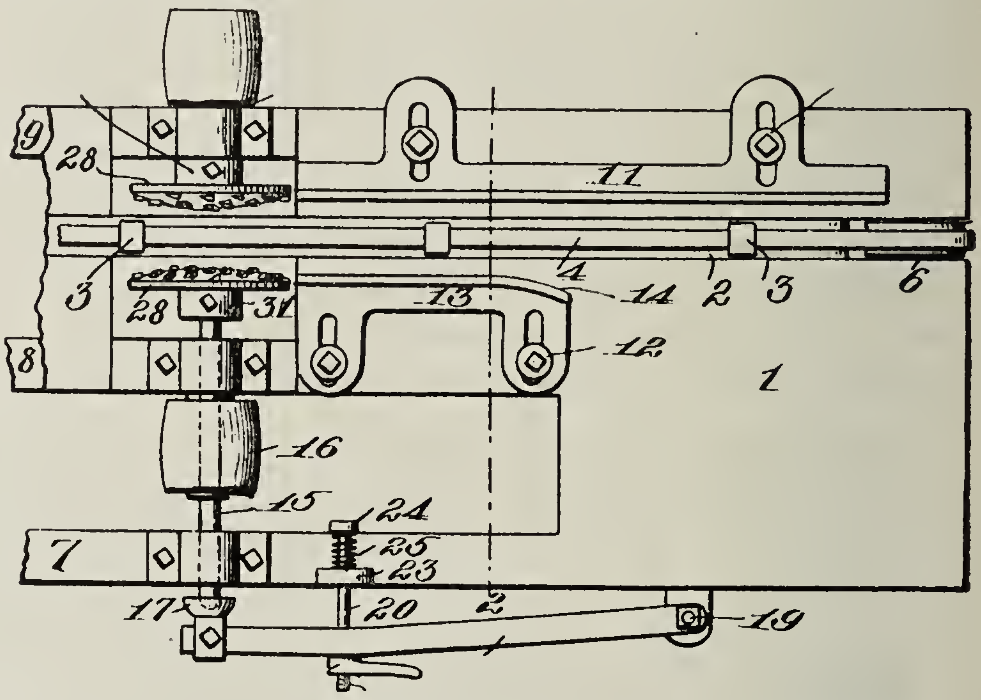
779,014. Brick-Making Machinery. George P. Wallis, Leeds, and George Fox, London, England. Filed Nov. 30, 1903. Serial No. 183,311.



Claim.—In means for the manufacture of sand-and-lime bricks in combination, a compound horizontal and vertical mixer, a vertical spindle through the center of vertical portion of said compound mixer, horizontal knives or elevators attached to said vertical spindle, a pair of horizontal spindles through the center of the horizontal portion of mixer, said horizontal spindles rotating at differential speeds, knives or blades attached to said horizontal spindles, a steam or hot-water jacket surrounding said compound mixer, a chute at the end of said horizontal portion of mixer, substantially as described and illustrated herein.

779,224. Brick-Cleaning Machine. Francis T. Leeder, Sioux City, Iowa. Filed June 23, 1904. Serial No. 213,850.

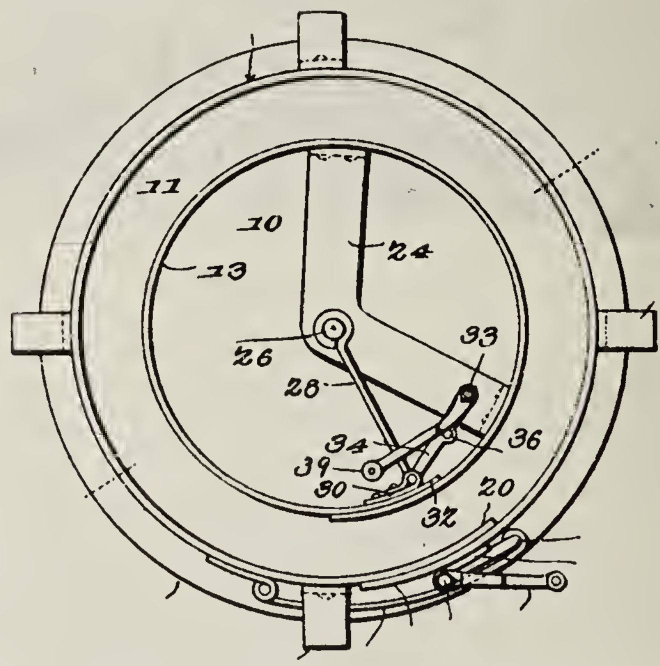
Claim.—A brick-cleaning machine having a pair of rotatable cleaning-heads, each comprising a disk having one face provided with a concentrically-arranged series of cutting-teeth at the center thereof, grouped in close proximity to each other, and further provided with a plurality of cutting-teeth irregularly disposed throughout said face.



A brick-cleaning machine having a pair of cleaning-heads, each of which consists of a disk, a hub connected with the disk, a concentric series of beveled teeth grouped in close proximity to each other and arranged approximately centrally of one face of the disk, and further provided with an irregularly-arranged series of beveled teeth on said face which extend from the edge of the disk to near the concentrically-arranged series of teeth, each of said heads substantially convexed in cross-section.

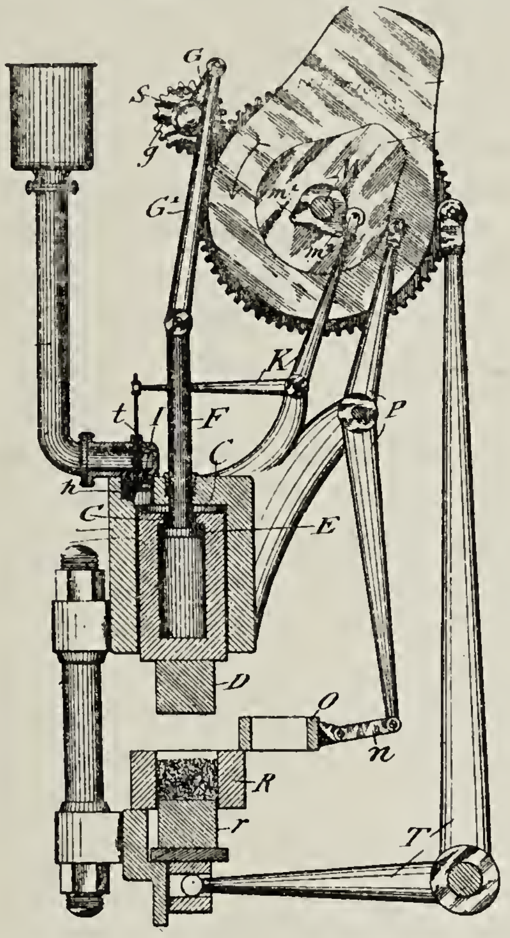
778,907. Cement-Pipe Mold. Levi Shell, Sibley, Iowa. Filed Oct. 24, 1904. Serial No. 229,783.

Claim.—In a mold for manufacturing cement pipe, a split outer shell having overlapping terminals, means for expanding and contracting said shell, an inner shell spaced from the outer shell and also provided with overlapping terminals, brackets rigidly secured to the interior walls of the inner shell, studs carried by the brackets, rods forming a pivotal connection between said studs and the inner lapping end of the inner shell, jointed bars connecting the inner lapping and outer lapping portions of said inner shell, and means for moving said bars laterally to thereby cause the expansion and contraction of the inner shell.



779,800. Hydraulic Press. Otto Phillip, Kothen, Germany. Filed Sept. 22, 1902. Serial No. 124,365.

Claim.—In a hydraulic press, the combination, with a stationary press-cylinder, of a hollow plunger guided therein and provided with a compressing-die at its lower end, a vertically-reciprocating pressure-spindle provided with a collar at its lower end for engaging the upper end of the hollow plunger, a liquid-supply pipe connected with the press-cylinder, a valve, normally open for opening and closing the connection between the press-cylinder and supply-pipe, and means for positively closing said valve at the proper time for producing the final pressure, substantially as set forth.

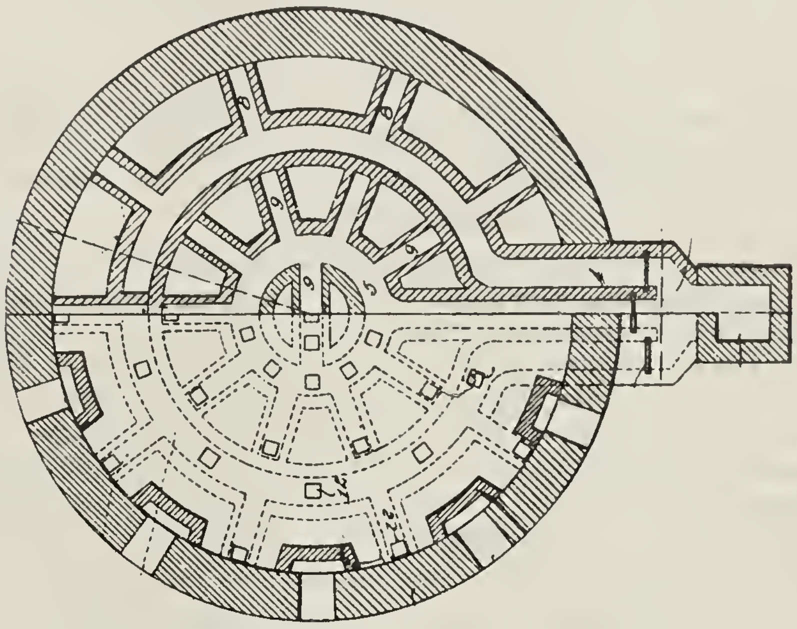


In a hydraulic press, the combination, with a stationary press-cylinder, of a hollow plunger guided therein and provided with a compressing-die at its lower end, a vertically-reciprocating pressure-spindle provided with a collar at its lower end for engaging the upper end of the hollow plunger, a liquid-supply pipe connected with the press-cylinder, a valve normally open for opening and closing the connection between the press-cylinder and supply-pipe, means for positively closing said valve at the proper time for producing the final pressure, a stationary mold vertically below the compressing-die, a bottom die, means for raising the bottom die when the final pressure has been imparted to the block, a filling-box above the mold, and means for reciprocating said filling-box so as to move it in line with the mold, and compressing-die for moving the block sidewise and producing the charging of the mold, substantially as set forth.

780,021. Downdraft Brick-Kiln. Thomas I. Brett, Fairmont, W. Va. Filed Dec. 29, 1903. Serial No. 186,969.

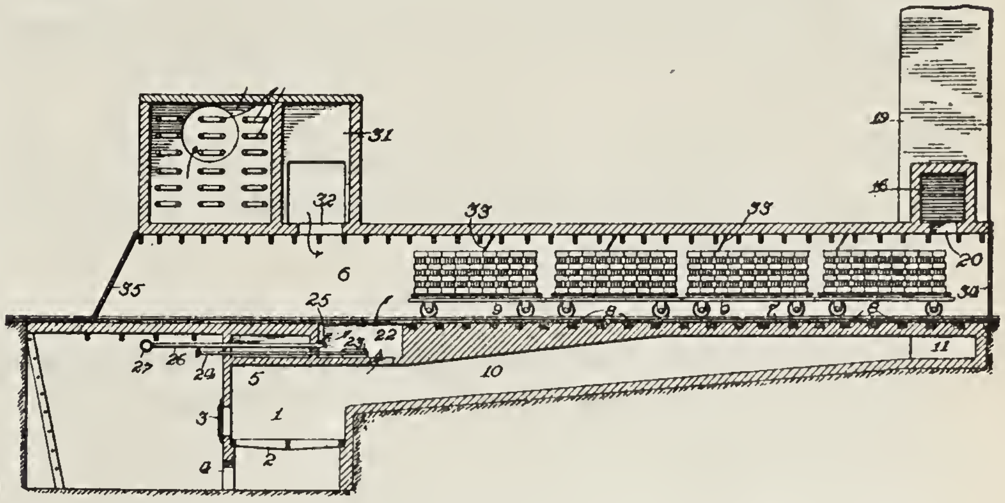
Claim.—1. A brick-kiln provided with a stack to one side of the kiln, a central circular flue beneath the floor of the kiln, a radial flue leading from the central flue to the stack, radial flues extending from the central circular flue and closed at their outer ends, two semi-circular flues, one on each side of the central circular flue but closed to the same and to the other, radial flues extending from each of the semi-circular flues to the outer wall of the kiln and closed at their outer ends by the said wall, a flue leading from each of the semi-circular flues to the stack, the area of the floor covered by the central circular flue and its radial flues being equal to the area of the floor covered by either one of the semi-circular flues and its radial flues, and means for controlling the draft of the central circular flue and the two semi-circular flues separately.

2. A brick-kiln provided with a stack to one side of the kiln, a central circular flue beneath the floor of the kiln, a radial flue leading from the central flue to the stack, radial flues extending from the central circular flue and closed at their outer ends, two semi-circular flues, one on each side of the central circular flue but closed to the same and to the other, radial flues extending from each of the semi-circular flues to the outer wall of the kiln and closed at their outer ends by the said wall, a flue leading from each of the semi-circular flues to the stack, bag-walls located above the floor and between the radial flues of the two semi-circular flues and means for controlling the draft of the central circular flue and the two semi-circular flues separately.



780,914. Dryer. John M. Rumbaugh, Wilkinsburg, Pa. Filed Nov. 6, 1903. Serial No. 180,017.

Claim.—In a dryer, the combination of a furnace, a drying-chamber adjacent thereto, a flue leading from said furnace to a stack and adapted to heat said drying-chamber by radiation, means to close the draft through said flue, a vapor stack or flue for the drying-chamber, a flue or port to convey the heat from said furnace direct to said drying-chamber during the time the draft is cut off through the combustion-flue, a valve or damper for the last-named flue or port, and means for controlling said valve or damper from the exterior of the dryer.



In a dryer, the combination with a furnace, of a drying-chamber, a combustion-stack, a combustion-flue leading from said furnace to said stack, means for cutting off the draft to said flue, a flue or port to convey the heat from said furnace direct to said drying-chamber during the time the draft is cut off through the combustion-flue, means controlling said flue or port, and an auxiliary or vapor stack for the drying-chamber and independent of the combustion-flue and adapted to produce sufficient draft to maintain combustion in the furnace during the time the draft through the combustion-stack is cut off.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,
Ninth Floor, Plymouth Building,
303 Dearborn Street,
CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.
Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVI. FEBRUARY 28, 1905. No. 4

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

The spring campaign will soon begin. Let us be ready for it.

Thoughtlessness leads to carelessness, carelessness leads to shiftlessness, and shiftlessness leads you to the grindstone.

The sky makes an excellent roof for this world of ours, but it is not the best cover for your brick yard implements and supplies.

The CLAY RECORD is the only semi-monthly clay journal in America. Read the news before it is stale. It costs only one dollar yearly to do so.

Keep an account book and record in it the transactions of each day. Jot down what you see of interest when you visit your neighbor's plant.

The 1905 meetings of the American Cermaic Society, the National Brick Manufacturers' Association, and the National Association of Manufacturers of Clay Working Appliances have been held.

A better place than Birmingham, Ala., in which they were held, could not have been chosen.

We were not unfamiliar or unacquainted with genuine southern hospitality, yet the truth compels the statement that the Birmingham brethren demonstrated not only what this means, but certainly did so enlarge upon and extend it as to make it nothing less than a royal welcome to and a kingly entertainment of the visiting brethren. To say more would, to all, save those whose good fortune it was to have been there, savor of exaggeration.

The clay-workers' membership of the National Brick Manufacturers' Association attending numbered about one hundred and thirty persons, which number, compared with the membership attending the recent state meetings held in Illinois and Iowa, indicates a difference of a very few only, and we note elsewhere it has been commented upon, besides prompting some suggestions, not necessary to repeat here and now, but which will doubtless be acted upon, for it will not be disputed that the attendance of practical brick makers of the country upon its annual meeting should be a larger percentage of their whole number than that indicated by the number present at the recent annual meeting; that there are causes for this state of things and that these causes should be removed, and we believe that they will be removed.

One of the attractions, and a source of profit to the visiting members of the several organizations was the "Exhibits." Nothing surpasses object lessons in educating either the young or the old, and a study of models of machinery, etc., is the most valuable education a clay worker can have, and an opportunity to examine the various devices used in doing given lines of work with the aid of the expert manufacturer explaining as he continues the examination, such as were afforded at Birmingham, should never be wasted, but, on the other hand, should be seized and worked and from it get all the information possible to be applied in practice in the future.

There is no denying the fact that at this time the people of this country are pretty thoroughly aroused regarding certain matters, and that public opinion has succeeded in stirring up the legislatures in several states, but it has not accomplished anything with the Congress, at least with the senate branch of it, but in spite of all this we can only wait and see what comes of it all; at this time being very much inclined to the notion that nothing of benefit will result, because history and experience both teach that nearly all, if not all such uprisings, have been "flashes in the pan."

Every observing, well-posted man not yet forty years of age may easily recall the tentative efforts made by legislation prompted or brought about by a tidal wave of public opinion, being followed by the subsidence of the waters leaving the shore fouler than ever. The Sherman anti-trust law, for instance. Aren't matters much worse now than when that act was passed? And haven't things been growing steadily worse ever since? And why? Because the people are so constituted that they soon weary, and, becoming indifferent, lose interest, etc. And if one may be permitted to be playful regarding so important a matter, the truth compels us to say that the present action on the part of the people was anticipated, more, encouraged, by the big men of the trusts and their friends, the legislators, and by an agreement amongst themselves they were to dole out a little "sauce in the spoon" in the way of legislation, relying on the experience in the past which had always resulted in their advantage, being confident this experience would again repeat itself.

When the Sherman law was enacted there was some alarm among financial people, owners of stocks and bonds of railways and industrial enterprises, and for a time there was a shrinkage in market values in these things; but observe the present trend in prices, notwithstanding a forceful president. Suits in courts against big corporations, indictments galore, and a dozen legislatures with hammer and tongs, and what do you see? Stiffening in prices everywhere, apparently no alarm. Why is it thus? Our reply is that the present experience will be like its predecessors; will result in every way to the advantage of those attacked, and all because of the namby-pamby traits of the people.

ACCIDENTS, DAMAGES AND LOSSES.

George Mickel had his hand badly cut while cleaning a repress at the Kelly Brick Works, at Windber, Pa.

An accident at the Sheridan Brick Works in Brazil, Ind., resulted in the death of Mr. Holloway and seriously injuring Mr. Bushman.

The Columbus (O.) Pottery Co. has been taken out of the receiver's hands, and the claim against the company settled in a satisfactory manner.

The six-kiln pottery plant of the New Castle (Pa.) Pottery Co. was sold, Feb. 28th. The plant is equipped with the latest machinery for making vitrified china.

Manager McKinnon, of the Ornamental Brick Co., at Wells, Mich., claims that he will be damaged to the extent of $10,000 by the new Bay Shore road running through his property.

G. R. Eastham is suing the White Hall (Ill.) Sewer Pipe & Stoneware Co. for damages growing out of the death of his son, Frank, who was killed while working at the company's steam shovel.

The Slater Brick Co., Billings, Mont., has filed its answer in an attachment suit brought against it by C. P. Slater, a stockholder, and its former president. The company alleges it owes him nothing.

Some of the creditors of the Sandpoint (Idaho) Brick Mfg. Co. have filed a petition in involuntary bankruptcy against the company. The creditors making the application represent indebtedness of over $4,000.

SPECIAL NOTICE.

H. S. Palmer's licensees are respectfully requested to report such damages as they may have sustained by reason of infringers or derogatory statements regarding the H. S. Palmer patents to this office without delay.

Harmon S. Palmer Hollow Concrete Building Block Co.,
Washington, D. C.

OBITUARY.

Matthew Mawhinney, a well-known brickmaker, formerly of Pittsburg, Pa., but for three years from Washington, Pa., died, age 69 years.

Hugh A. Stephenson, an early day brickmaker, of Kansas City, Mo., is dead. He came there in 1856 and engaged in brickmaking and contracting.

Walter Field Plunkett, secretary of the Washington Brick & Tile Co., Seattle, Wash., died very suddenly at his home, 2302 4th avenue. He was 33 years old and a civil engineer.

Chas. B. Kimbell, an old resident of Chicago, and formerly president of the Western Stone Co. and connected with the Pressed Brick Co., died at Los Angeles, Cal., after a long illness. He was born in Chicago in 1838.

Marvin J. Gates, son-in-law of the late Artemus Lamb, Clinton, Ia., died suddenly at his home in that city. He was 41 years old. A director of the I. & I. Ry., the People's Trust & Savings Bank, and the Clinton Granite Brick Co., and several other enterprises.

Thos. F. Jones, master of the first masonic lodge west of the Alleghanies, died at the home of his step-daughter, in Columbus, Ohio. He was born in Washington Co., Pa., in 1817. He was a pioneer in the brick-making business and turned out the first pressed brick in the northwest.

FIRE! FIRE!! FIRE!!!

The roof of the kilns of the Ostrander Fire Brick Co., near Troy, N. Y., were destroyed by fire, causing quite a loss.

A small fire occurred at the plant of the New Jersey Terra Cotta Works, Charles street and Hall avenue, Perth Amboy, N. J. The damage was not heavy.

The plant of the Empire Brick & Supply Co., 12th avenue, between 47th and 48th streets, Manhattan, New York, N. Y., sustained quite a loss by fire; 26 horses narrowly escaped being burned to death.

The plant of the Atlantic Brick Co., Rossville, S. I., N. Y., was destroyed by fire. The loss will reach $10,000, largely on machinery. Owing to its location, the fire practically had to burn itself out.

WILL ENLARGE THEIR PLANT.

G. N. Fairchild, Sioux City, Ia., manager of the Lower Brick Company and the Sioux Paving Brick Company, says that $30,000 will be spent this year in new additions to the plants. This will be done to care for the growing business. The Sioux company will add new continuous kilns, new boilers and drying chambers and grinding machines. The plant will then have a capacity of 90,000 brick a day.

At the Lower Brick Company yard new dryers and other machinery will be added until the plant will have a capacity of 60,000 brick a day. This will give a combined capacity of 150,000 brick a day at the two plants. The force will be increased from seventy-five men to about 125. Last year the plants sent out 1,200 cars of brick to Sioux City territory.

CREDITORS FAVOR TIME EXTENSION.

Creditors representing some 90 per cent of the claims against the Reese-Hammond Fire Brick Company and its allied concerns, met in the office of Hall & Adair, 328 Frick building, Pittsburg, Pa., and took action looking toward a dissolution of the receivership and an extension of the time for the settlement of claims against the various companies involved.

Statements made to the creditors showed that since November, 1903, when the Reese-Hammond interests went into the receiver's hands, the plants have only been partially operated, but that nevertheless, the net profit was in the neighborhood of $80,000, that the business outlook was bright, and that if the proper care was taken in the management and operation of the various plants it was only a question of a few years until the debt could be reduced to such an extent as would allow the company to again take charge of the plants and operate them, without being too heavily burdened.

The Creditors' committee therefore recommended, that steps be taken to have the receivership dissolved, and the affairs of the companies be administered under the supervision of the Creditors' committee for the ensuing five years. The profits, of course, will be largely applied to the reduction of the debt and the satisfaction of claims against the companies.

The creditors present, who hold about 90 per cent of the claims, unanimously voted to sign the application for the dissolution of the receivership and the conduct of the business under the plan proposed. The other creditors are expected to follow their example and it is believed that with fair business fortune, the plants can be run steadily and the debt almost if not entirely wiped out in five years.

If the remainder of the creditors sign, it is planned to at once put all the plants in operation and keep them running steadily as long as the business conditions will justify it. This will be welcome news to the workmen at Bolivar, Garfield and other points where the company has plants. For over a year now they have had little work and having invested their savings in homes near the plants, have been compelled to look for other work when the plants would shut down. Many cases of destitution resulted from the inability to secure other employment.

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STATEMENT OF THE SEWER-PIPE COMPANY

The balance sheet of the American Sewer Pipe Company as of Dec. 31, follows:

ASSETS.	
Cost of properties, including improvements to date, less depreciation	$9,208,005
Cash	242,064
Accounts and bills receivable, less amount reserved for bad debts, allowances, etc.	359,489
Inventory—Manufactured goods and supplies on hand	832,966
Total	$10,642,579
LIABILITIES.	
Capital stock issued	$7,805,700
First mortgage 6 per cent bonds	2,500,000
Less in treasury	507,500
Less redeemed and canceled	459,500
Accounts payable	57,407
Bond interest and taxes	40,740
Dividend No. 3, paid Jan. 1, 1905	58,542
Surplus, after deducting dividends, bond interest, and depreciation	1,147,189
Total	$10,642,579

MUCH CAPITAL INVESTED IN BRAZIL CLAY INDUSTRIES.

The Weaver Clay Company was established in 1872, and is the oldest clay plant in this city. It was incorporated in 1872, with a capital stock of $10,000. The annual output is estimated at about $35,000. The company employs thirty-two men and has six twenty-six foot circular down-draft kilns and two thirty-foot ones. The plastic underground clay, of which there is an inexhaustible supply, is used. They manufacture stone pumps, hollow brick and many other clay products are manufactured. J. S. Kayward is secretary of the firm.

The McRoy Clay Company was incorporated in 1900, with a capital stock of about $50,000. The factory occupies about twelve acres. The company employs 150 men, who are skilled workmen. Electricity furnishes power for the plant.

The Excelsior Clay Works was incorporated in 1895. The works cover about fifty-two acres of land and employs fifty men. The company mines its own coal and use over thirty tons each day. A vein of shale which is twenty-six feet deep and a four-foot vein of block coal, under which is a vein of fire clay are being worked. George Brandenberg is president and general manager of the works.

The Chicago Sewer Pipe Company was established in 1892, with H. R. Page as president and R. H. Morrish as manager. They employ about fifty men at the works.

The Standard Pottery was established in 1899. It is located in the southern part of Brazil on the Vandalia tracks. The plant has an output of about 150,000 gallons of stoneware each month. It now has seven kilns and employs fifty-five men and boys.

The Ayer McCarel Clay Company was established in 1902, with a capital stock of $100,000. William McCarel is vice-president and manager, and J. B. Ayer, secretary-treasurer.

The Sheridan Brick Works was established in 1900. The company makes the celebrated red building bricks which are used extensively. The capacity of the plant is about 40,000 brick a day.

The Indiana Paving Brick Company was established in 1889. The company manufactures vitrified paving blocks and has an output of 60,000 brick a day.

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LARGE CONTRACTS HAVE BEEN MADE.

The Purington Paving Brick Company, Galesburg, has recently been making some large contracts. For one order they have been awarded a contract of five million brick for the Chicago stock yards. These are for No. 2 blocks and will take about all this kind that the company will have this year. Another big contract is for 3,000,000 continental faced brick for the large new building of Sears, Roebuck & Company, of Chicago. This is one of the largest contracts for faced brick that has been let in Chicago in a long time. The popularity of these faced brick is increasing rapidly, because of the handsome color of the brick. The company is completing the costly improvements that they have been making and the factories have been started up. The work of putting in filters is now in progress. A busy year is before the company.

STOCKHOLDERS APPROVE PLAN OF RECAPITALIZATION.

At the annual meeting of the Illinois Brick Company of Chicago, the plan of recapitalization carried, and directors were elected to fill the places of those who retired a short time ago. No income account was issued, but the company apparently earned something in excess of 8½ per cent on the outstanding preferred issue of $4,000,000. Out of earnings for 1904, 6 per cent was paid on the preferred. Following is the balance sheet:

ASSETS.

	1904. Dec. 31,	1903. Dec. 31,
Plants	$7,779,681	$7,779,681
Preferred stock, unissued	449,500	449,500
Common stock, unissued	649,500	649,500
Preferred stock in treasury	128,800	128,800
Common stock in treasury	128,800	128,800
Bonds	....	300,000
Accounts receivable	254,363	270,647
Inventories	382,582	367,328
Bills receivable	5,895	22,446
Cash	5,958	19,656
Totals	$9,785,082	$10,116,361

LIABILITIES.

	1904. Dec. 31,	1903. Dec. 31,
Capital stock, preferred	$4,000,000	$4,000,000
Common stock	5,000,000	5,000,000
Bonds	....	370,000
Bills payable	....	182,000
Accounts payable	113,239	101,032
Insurance fund	16,000	....
Dividend	68,434	....
Construction fund	17,966	....
Surplus	569,442	463,329
Totals	$9,785,082	$10,116,361

In his address to shareholders, President Prussing called attention to a number of matters. He noted that during the year an "insurance reserve fund" of $16,000 had been created, and also a "construction fund," to which latter is added $10,000 a month. In 1904 the fund received $60,000, and from it and the monthly additions thereto the necessary improvements of plants were made. A thoroughly up-to-date, two-machine brick yard is being built, which will be ready for operation in the spring. It is said all doubtful or slow accounts receivable inherited from previous years had been placed in "suspense," and do not appear in the balance sheet. The item of inventories was based on actual cost of materials. On Dec. 31, the company had on hand 105,000,000 brick, of which 30,000,000 were sold. The aggregate cost of manufacture was no higher than before, and no brick was sold at a loss.

The company secured an option on 1,253 shares of the preferred stock from large stockholders, who agree to sell this amount to the company at 60. This stock will be retired in connection with the recapitalization scheme.

Officers and directors were elected as follows:
President—George C. Prussing.
Vice-president—Adam J. Weckler.
Secretary—W. E. Schlake.
Treasurer—C. D. B. Howell.
Auditor—C. B. Ver Nooy.
Directors—George C. Prussing, Adam J. Weckler, C. D. B. Howell, C. B. Ver Nooy, William Schlake, William N. Legnard, Phillip Lichtenstadt, Joseph W. Moulding, David R. Forgan, Marvin A. Farr, and E. C. Potter.

KANSAS BRICK MAKERS FORM AN ASSOCIATION

The Gas Belt Brick Manufacturers of Kansas met at Independence, and have formed a permanent organization, with J. J. Amos, of Humbolt, as president and E. R. Dick, of Coffeyville, secretary. About thirty companies were represented. Several committees were appointed and it was decided to meet every six weeks, to keep in touch with the work in the gas belt. The new association will be called the "Brickmakers' Association."

The social side of these meetings will be a feature. A banquet was enjoyed at the close of the business session.

There are a large number of brick plants in the gas belt and lively competition has brought the price of building brick down to a most reasonable figure.

TO FORM A BIG CHICAGO BRICK CO.

With the filing of a suit in Springfield for the annulment of the charter of the National Brick Company, incorporated in 1882, a step was taken toward the formation of a brick manufacturing company in Chicago which will have a capital of $500,000 and be ready for business within ninety days. The new concern, it is asserted, will be a strong competitor of the Illinois Brick Company, capitalized at $9,000,000, and will establish yards throughout Cook County. Its incorporators include Bernard F. Weber, Louis Reimer, Fred La Bahn and Henry Busse, all of whom were connected with the Illinois Company until three weeks ago, Mr. Weber having been vice-president.

NATIONAL FIREPROOFING CO.'S STATEMENT

The National Fireproofing Co. last year had a loss of 40 per cent in net profits. The earnings were 6¾ per cent on the $7,950,000 preferred, on which 5¼ instead of the regular 7 per cent was paid. Depreciation charges of $500,000 were made from the surplus, which reduced actual earnings to barely nothing on the preferred. In the previous year earnings were at the rate of 11½ on the common stock, when 4½ was paid. In 1902 the company earned 16 on the common and paid 6 per cent. The earnings compare:

	1904.	1903.	1902.
Net earnings	$ 636,939	$1,107,289	$1,126,968
Reserve	100,000	100,000	....
Balance	536,939	1,007,289	1,126,968
Dividends	417,593	713,538	554,784
Surplus	119,346	293,751	572,184
Previous surplus	2,071,719	1,835,756	....
Totals	2,191,065	2,129,507	....
Depreciation	500,000	57,788	....
P. & I. surplus, Dec. 31	1,691,065	2,071,719	1,835,756

DIDN'T WANT TO HUNT TOO LONG.

An Indian chief paid a lawyer a bill and asked for a receipt. The lawyer asked him what he knew about a receipt. This is the Indian's explanation: "S'pose may be me die; me go to Heben me find gate locked; me see 'Postle Peter. He say: 'Big Chief, what you want?' Me say: 'Me want into Heben.' He say, 'you pay Mr. Jones that money?' What me do? Hab no receipt, hab to hunt all over h—— to find you." The chief got the receipt.—*Ex.*

SAND OR LIME-BRICK OR BLOCK NEWS.

The Harlan (Ia.) Brick & Tile Co. has increased its facilities by putting in a cement block machine.

The Sharp Sand Brick Co., Columbus, O., which has a plant in Fairfield Co., will begin making brick within two or three weeks.

The Altoona (Pa.) Pressed Brick Co. has now put their plant in operation for the season. The company anticipates a very prosperous year.

The Houston (Texas) White Brick Co. have their buildings all completed and the greater part of the machinery on the ground, and part of it set.

The Fremont (O.) Pressed Brick Co. have completed the work of overhauling their plant, and are now turning out a fine quality of sand-lime brick.

The Aberdeen (Miss.) Sand-Lime Brick Co. has been incorporated, with $100,000 capital stock, and a plant constructed for the making of brick.

J. W. McCulloch, Owensboro, Ky., is at the head of a $50,000 company, that will very shortly have installed a sand-lime brick plant, under the Schwarz system.

W. F. Saul, of Charleston, S. C., is at Jacksonville, Fla., to organize a sand-lime brick company. He has secured the endorsement of President Garner, of the Board of Trade.

The Berthelet Sewer Pipe Co., Milwaukee, Wis., was established in 1868. James Morrison is president, and Alfred Wells, secretary and treasurer. They make Portland cement sewer pipe.

The Berkshire Pressed Brick Co., Canaan, Ct., has dissolved. Two thousand dollars were spent in looking up the matter. W. A. Neracher was president; A. L. Barnes, treasurer, and Arthur P. Freeman, secretary.

The Saginaw (Mich.) Pressed Brick Co. has held their annual meeeting and elected W. C. Mueller, pres.; C. L. Cowles, vice-pres.; Wm. B. Baum, treasurer, and H. P. Baker, secretary. The capital stock is $30,000.

The Menominee (Mich.) Brick Co. has been incorporated with $30,000 capital stock, and will make sand-lime brick by the middle of May. G. A. Blesh is president; H. A. Pick, of West Bend, Wis., vice-president, and Alfred Henes, secretary and treasurer.

The Cement Block & Con. Co., Bellefontaine, O., is the name of a new company. They will manufacture cement building blocks, using three machines, a block machine, sill machine and a step machine; besides, will operate a brick machine, to make 10,000 brick daily.

The Red Wing (Minn.) Brick Co. has been incorporated, and will build a sand-lime brick plant, adjoining the sewer pipe works. The officers are: Chas. A. Betcher, president; G. Gerlach, vice-president; John J. Berry, secretary and manager, and Gustave Lilyblad, treasurer.

The Waterloo (Ia.) Granite Brick Co. has been incorporated, with $50,000 capital stock. The officers are B. S. Harrison, president; Charles Holtz, vice-president; C. J. Miller, secretary and treasurer. They will build a sand-lime brick plant near the old paper mill.

MISCELLANEOUS ITEMS.

The Garland-Weaver Brick Co., Nashville, Tenn., has been incorporated, with $10,000 capital stock.

The Huntingburg (Ind.) Dry Pressed Brick Co. will improve to the extent of $10,000 the coming season.

The Newburgh Brick & Clay Co., Cleveland, Ohio, has increased its capital stock from $50,000 to $100,000.

McKnight Bros., of Humboldt, Tenn., have bought machinery for a steam brick yard and will greatly enlarge their plant.

Prof. E. C. Lindermann, Boulder, Col., has organized an independent clay company for the manufacture of tiles and pottery goods.

The Southern Ohio Portland Cement Co., Ironton, O., are preparing to erect a plant for the manufacture of all kinds of brick.

The Marion Brick Works, Montezuma, Ind., will expend $10,000 on a new brick drying system that will lessen their cost of production.

Easum Bros., Colfax, Wash., have ordered new machinery and power and a drying plant, so that they can turn out double their present capacity.

The Atlantic Brick Co., Rossville, N. J., are to build a large dock in front of their works and ship considerable of their goods by water hereafter.

The Greenfield (Ind.) Brick Co. has been incorporated with $20,000 capital stock. The directors are Charles Barr, Sam'l S. Boots and Ralph R. Boots.

Commissioner of Public Works Maybury, of Detroit, Mich., will re-advertise for bids for shale for their Municipal Paving Brick plant. Only one offer was tendered, at $1.70 per ton.

For some time past there has been a plan on foot to build a 25,000 brick daily capacity plant at Saxton, Pa. The company will be capitalized at $40,000. Stolers & Barnett are the promoters.

The Louisiana Portland Cement Co., New Orleans, La., will build a $600,000 Portland cement plant at Lake Borgne. J. A. Cruikshank, of Bellefontaine, O., and C. F. Ritter, of Covington, Ky., are interested.

Louis Ismay, Fulton, Mo., has sold his brick yard to John Harris, who will engage in the manufacture of brick as soon as the weather will permit. Mr. Ismay has gone to Ft. Smith, Ark., for his future home.

The New York Brick & Paving Co., Syracuse, N. Y., has elected former Mayor Jacob Amos and Postmaster D. H. Bruce to its board of directors, to succeed the late Thomas Merriam and A. A. Howlett. The other directors are J. L. King, W. B. Cogswell, E. M. Klock, J. L. Breed and T. J. Leach.

The 20th annual meeting of the officers and directors of the Lexington (Ky.) Brick Co., resulted in F. A. Cramer being re-elected president and manager; W. C. Cramer, vice-president; W. S. Cramer, secretary and treasurer, and H. C. Cramer, superintendent. They make 10,000,000 brick annually, and are now installing a Martin Dryer and Arnold-Creager Co. clay elevators and conveyors.

Wm. Miller, Kewaskum, Wis., wishes to sell his old established brick works.

The Robinson Clay Product Co., Akron, O., are increasing their brick plant at Malvern to twice its former size.

Mitchell, S. Dak., citizens think they have some fine clay for brickmaking, and are trying to establish a plant there.

James C. Leonard, an oyster packer and brick manufacturer at Cambridge, Md., is a candidate for postmaster of that city.

The Shackleford Brick Co., Des Monies, Ia., has amended its articles of incorporation and increased its capital stock to $50,000.

A 30-foot vein of fine clay has been found on the land of I. W. Shellhammer, of Tank, Pa., and it is likely that a brick yard will be started.

Miller Bros., Paxinos, Pa., will erect a large brickmaking plant for making common and fancy brick. The plant will be in operation by April.

The Nebraska City (Neb.) Brick Co. re-elected the old officers and directors of their company, and contemplate enlarging the yards and putting in new machinery.

S. W. Felton has sold the Grand Tower (Ill.) Brick Works to Prof. E. L. Blake, who will erect new drying sheds and put the plant in operation. Mr. Felton will manage it.

The directors of the Ft. Wayne (Ind.) Brick & Tile Co., re-elected William Geake, president; Ferd. Meier, vice-president; E. C. Miller, secretary and manager, and Henry Keller, treasurer.

The Des Moines (Ia.) Clay Mfg. Co. has commenced making improvements to its plant on 8th street. Much new machinery, a drying plant and kilns will be added. O. C. Pixley is the manager.

H. B. Errot has succeeded G. E. Carlyle as vice-president of the Portsmouth Harbison-Walker Brick Co. L. C. Turley is the president. Mr. Carlyle and others will build a plant for themselves.

The Center Point (Ind.) Clay & Brick Co., a $40,000 company, have made all preliminary arrangements to erect a plant to manufacture shale products. John and Charles Clifton of Peru are interested.

At the annual meeting of the Beaumont (Tex.) Brick Co. all the officers were re-elected except C. H. Lowe as secretary. He was succeeded by M. F. Parker, of Chicago, Ill. F. H. Comisky is the general manager.

The administration of the estate of Stephen W. Joyce, deceased, sold a one-half interest in the Joyce Bros. Brick Works, at Grafton, W. Va., to Thos. E. Joyce, the junior partner, for $2,500. Mr. Joyce is now the sole owner of the property, and will increase the capacity of the plant.

The California Vitrified Brick & Tiling Co., San Diego, Cal., has been incorporated with $75,000 capital stock. The directors are S. C. Lamb, S. J. Eubanks, E. P. Johnson and H. E. Eakins, of Los Angeles, and C. E. Anthony, of San Diego. The office is at 854 4th street, and the works will be built within the city limits.

The Cincinnati (O.) Sewerpipe Co. has increased its capital stock from $5,000 to $10,000.

The Terra Haute (Ind.) Brick & Pipe Co. have increased their capital stock from $50,000 to $125,000.

The Elk City (Kansas) Pressed Brick Co. is now assured. W. R. Smith and S. J. Allen are interested.

The Quitman (Ala.) Brick Mfg. Co. has been incorporated with $40,000 capital stock by C. S. Edmondson and associates.

Elgin & Richmond have leased the plant of the Hannibal (Mo.) Pressed Brick Co., which has been idle for some time and will put it in operation.

Geo. H. Mallory has sold a half interest in the Pierce (Neb.) Brick Co. to W. L. Van Derpool. They will make some improvements to the plant.

The Riverside Brick & Mfg. Co., Hattiesburg, Miss., has been incorporated with $10,000 capital stock by W. S. Morrison, G. L. Hawkins and others.

D. R. Hughes sold his interest in the Martin & Hughes brick plant at Astoria, Ill., to Wm. Hoffman, and Martin & Hoffman will continue the business.

The Devlin Pressed Brick Co., Chester, Pa., is the latest corporation that will erect a plant near Bridgewater. The railroad sidings are now being put in.

Charles Jamison & Whitcomb Stone have bought machinery and will build a brick works on the farm of Mr. Jamison, two miles north of Linden, Mich.

The Richlands (Va.) Brick Co. has been incorporated with $50,000 capital stock by D. G. Robinson, president; H. Y. Ayers, secretary, and Joel Booth, treasurer.

Extensive improvements are under way at Chelsea, N. Y. It is the intention of George Cism, the manager, that no less than 5,000 cubic yards of clay be excavated.

John F. Horne has bid in at $12,500 the brick plant of the McCroskey Mining & Mfg. Co. at Lonsdale, Tenn. The plant is a new one and was sold at master's sale.

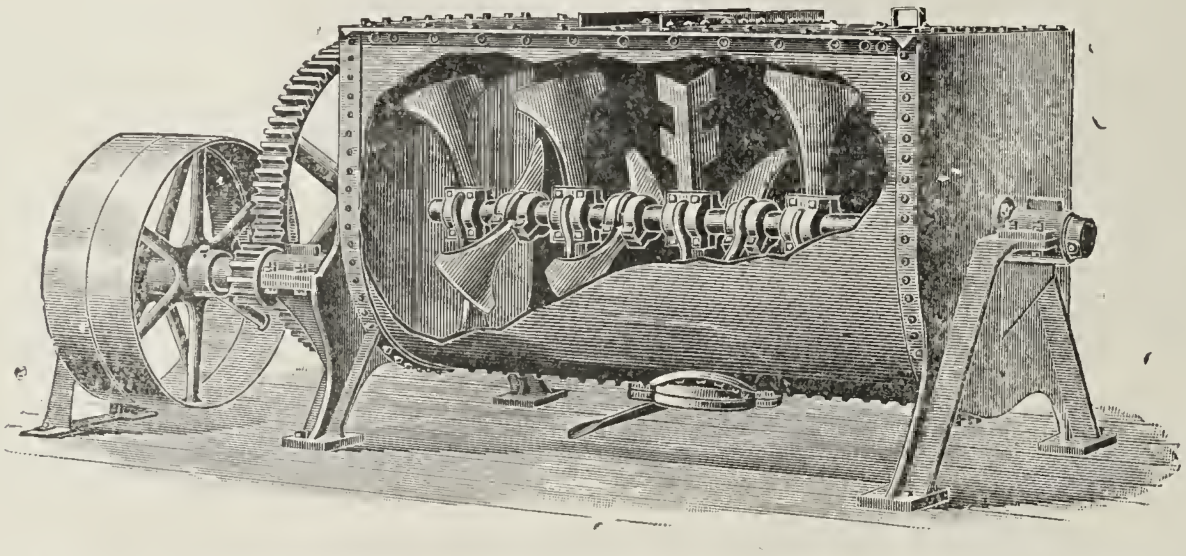
Carl Ericson has bought four acres of land on the C. P. & St. L. Ry., which he expects to use as a brick yard. This season he will conduct the A. W. Anderson brick works.

The Richards Brick Co., Edwardsville, Ill., has been incorporated with $25,000 capital stock. Incorporators: Ben H. Richards, B. H. Richards, Jr., and Russell H. Richards.

John Murray & Joseph Riberdy, Cohoes, N. Y., are to have a brick-making plant at that place, and Wm. Mansfield and the heirs of John B. Newton will both build yards at Crescent.

The Brazil (Ind.) Clay Co., which was organized some time ago, state that they expect to begin work on the plant as soon as the weather will permit. A. H. Zimmerman is the manager.

Bernard F. Weber of Chicago is at the head of a company to be called the National Brick Co., $500,000 capital stock, that will build three yards in Cook county. Options have been secured in three places.



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FOR SALE.

Sand-Lime Brick Factory, in progressive Southern seaport city of over 25,000 inhabitants. Finest climate in the world. Factory in full operation. Over 2,000,000 brick made and sold. Inexhaustible supply of sharp sand. Shipping facilities unsurpassed. Plant costing $30,000, located on entire city block, 330x330 feet. $6,000 new machinery just added. Reason for selling, owners are engaged in other business and cannot give this their personal attention.

OPPORTUNITY, care Clay Record.

BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

FOR SALE.

Good Brick and Tile Factory. Good clay, good railroad facilities, and good field especially for tile.

B. P. C., care Care Clay Record, Chicago.

FOR SALE.

White Glass Sand or Sand Brick Property, near St. Louis, Mo.. Situated on two roads. All facilities. Switches on property. Address

M. S. G.,
Care Clay Record, Chicago, Ill.

SUPERINTENDENT WANTED.

Superintendent for a new dry press yard in Minnesota. Must be a good burner in open kilns. Give references and salary desired. Address

B. E. C., care Clay Record.

WANTED.

Two Clay Gatherers. Must be in No. 1 condition, perfect in every respect, good working order. Give lowest cash price. Address

J. M. CRABILL,
Clarinda, Iowa

Machinery For Sale.

FOR SALE.

50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.

Also 55 flat cars for soft mud brick, with foot pallets. Track gauge 25 inches.

Both styles of cars in first-class repair.

ATLAS CAR & MFG. CO.
Cleveland, Ohio

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine. Address

"GIANT,"
Care Clay Record, Chicago.

FOR SALE.

1 Raymond Victor double die steam repress.
1 Raymond Columbian double die steam repress.
1 American Clay Working Machinery Co. Eagle double die steam repress.
3 Bonnot double die steam represses.
2 Penfield single die steam represses.
1 four-mold Boyd Dry Press, new.
All in thorough repair.

Address E. C.,
Care Clay Record.

FOR SALE—CHEAP—1200 Steel Crimped Pallets. 10x34 inches. Address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

MACHINERY FOR SALE.

$200.00 buys a Freese Combined Brick and Tile Machine and Pug Mill. Dies, Tables, complete, No. I. Good order.

Address OHIO,
Care Clay Record, Chicago.

FOR SALE—CHEAP—New and re-laying rails, 12, 16, 20 and 25 pound. For prices, address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE.

Four-Mold Dry Press, absolutely as good as new. made only one kiln of brick. Can sell for less than half original price. Address

"DEALER," care Clay Record.

FOR SALE.

For sale at a bargain, a J. D. Fate Company Stiff Mud Brick Machine, with Bensing Automatic Cutting Table, practically as good as new, Capacity, 5,000 per hour.

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To exchange for a good brick and tile plant, a well located and improved farm. Address

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The only preventative for scum and discoloration on facing Brick and Terra Cotta; neutralizing the Sulphate of Lime in the Clay and Water.

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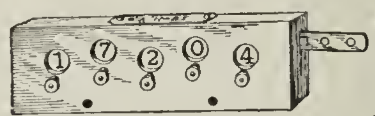

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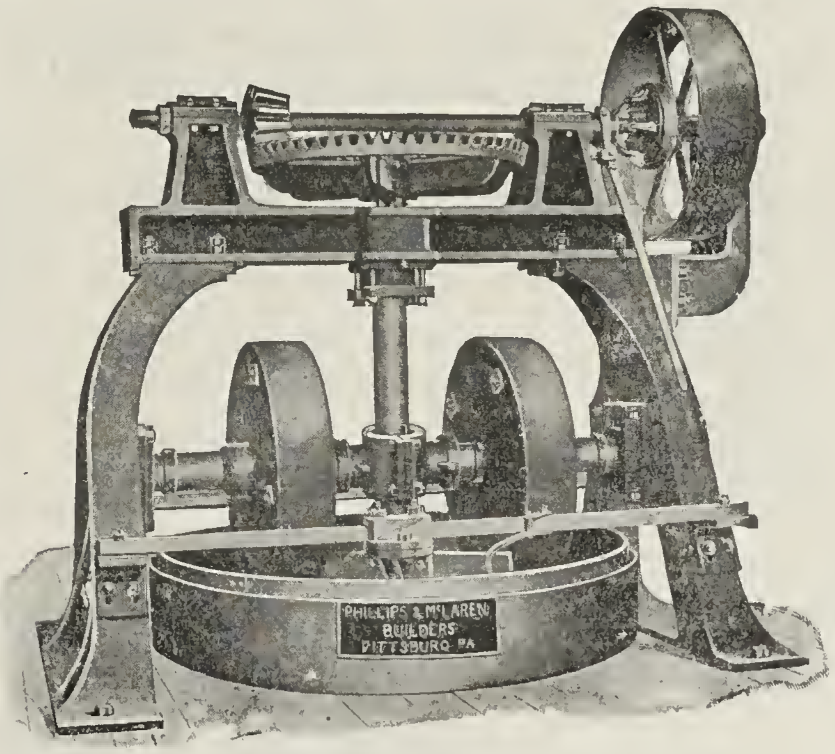

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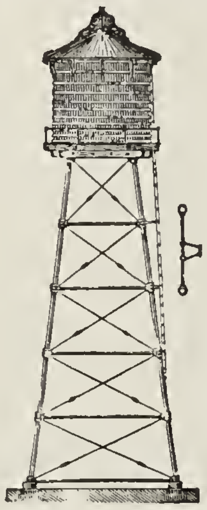

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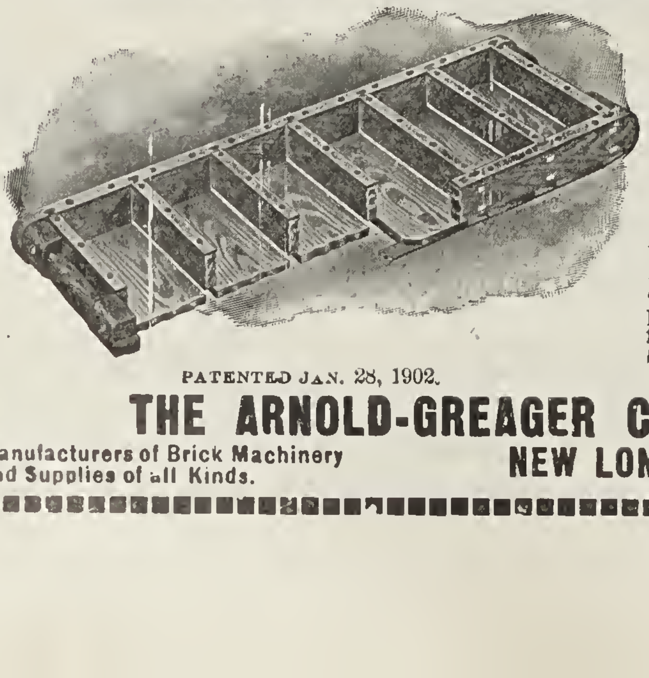

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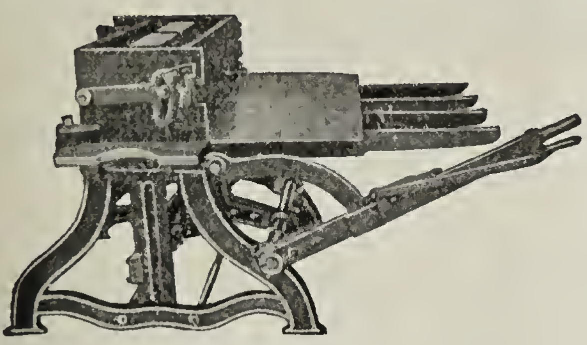

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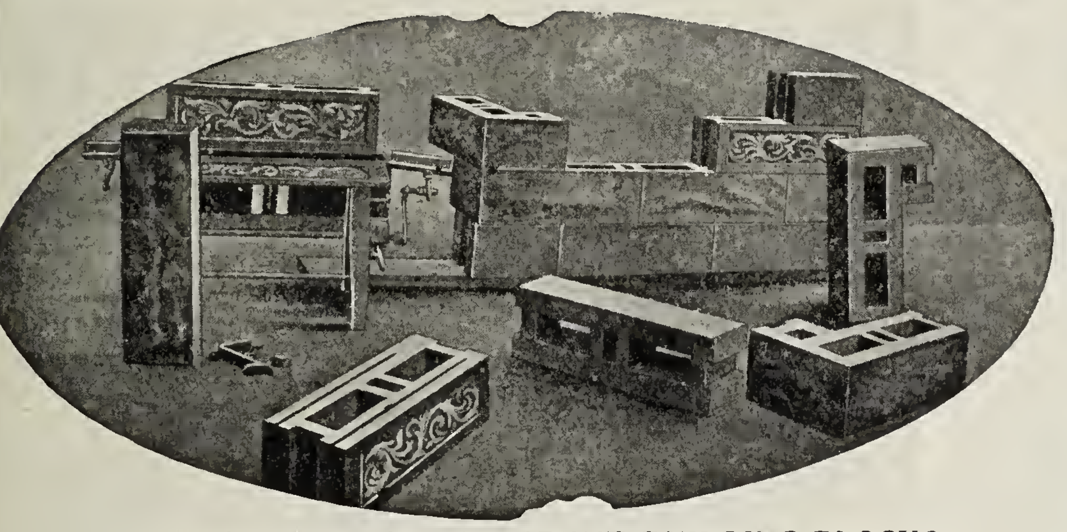

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A fine brick plant, in good section, in city of 50,000 people, can be bought at a bargain. Plant is practically new. Present owners are not brick men. This is a good opening for man with capital or for a company headed by good brick manufacturer. Information to parties interested.

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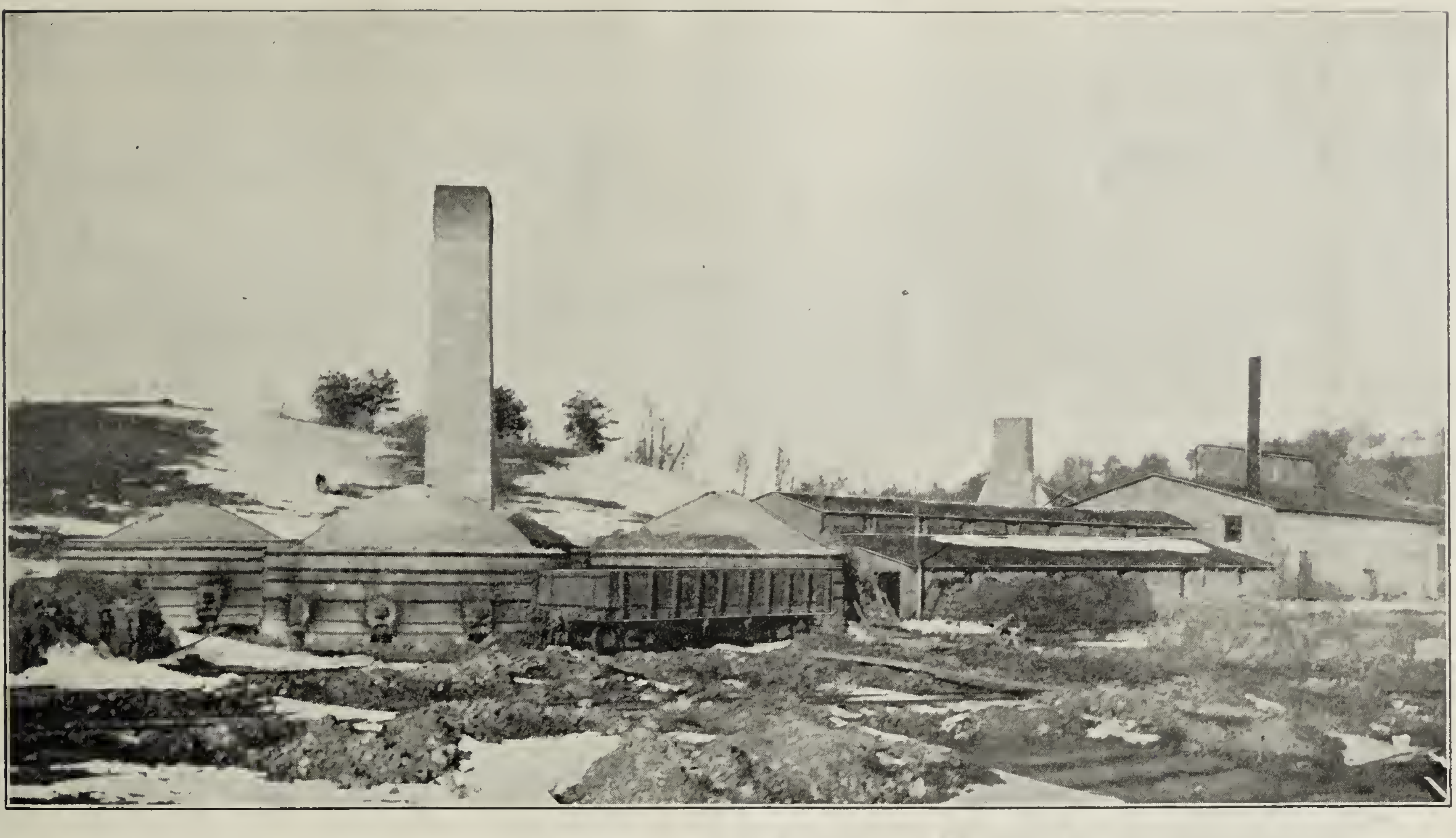

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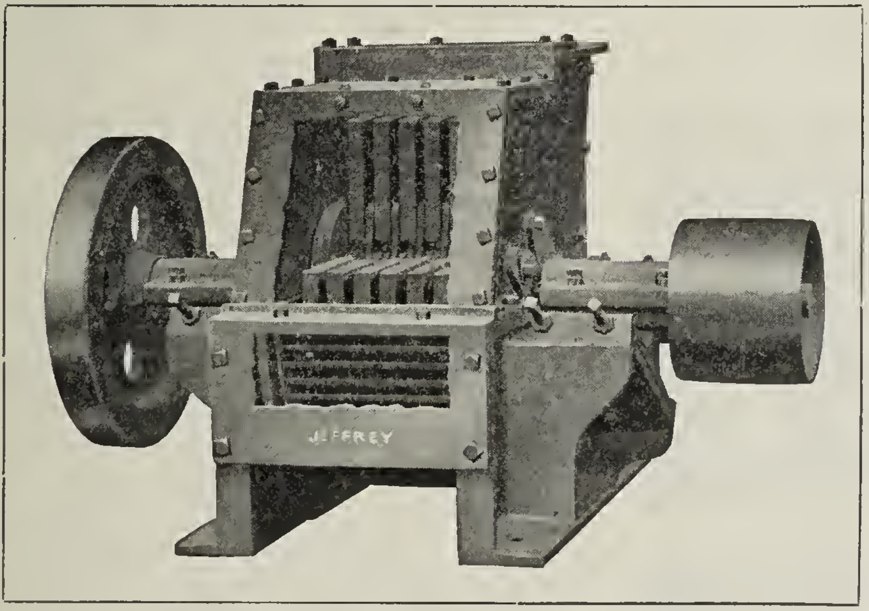

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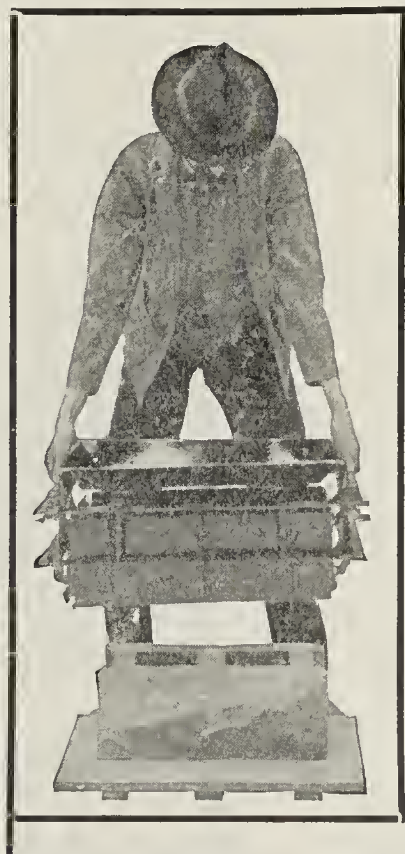

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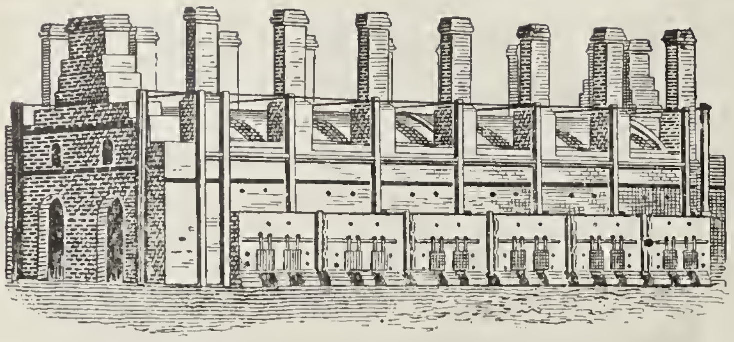

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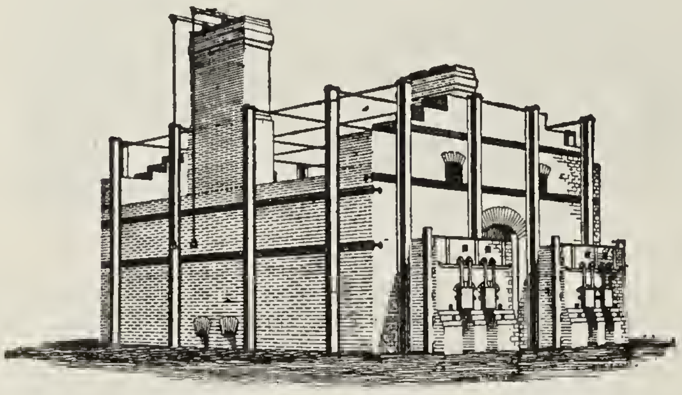

Build the best; it is the cheapest in the end.

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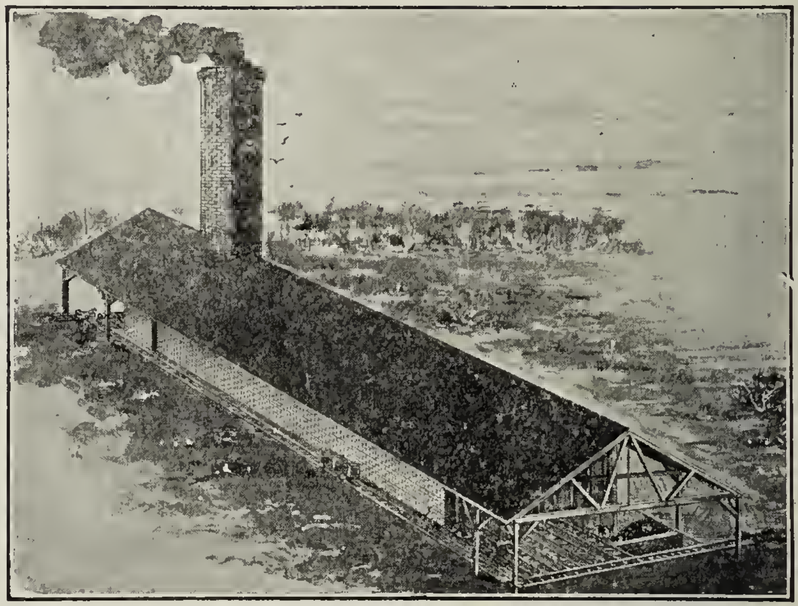

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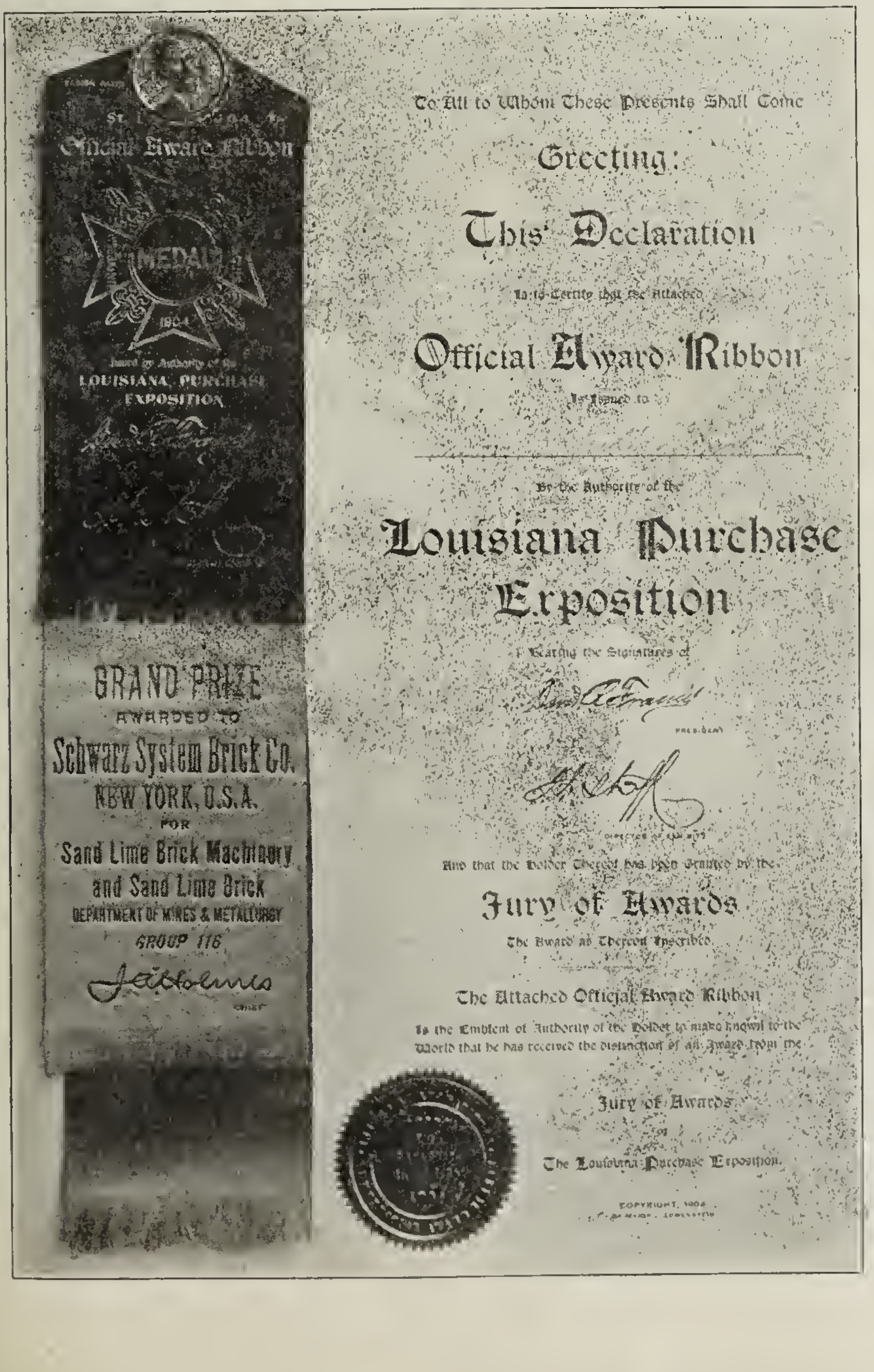

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If so, you need what we have.

Our System is used by the first Sand-Lime Brick Plant in the United States, and has been in continuous operation and has produced and sold more brick than any other single plant.

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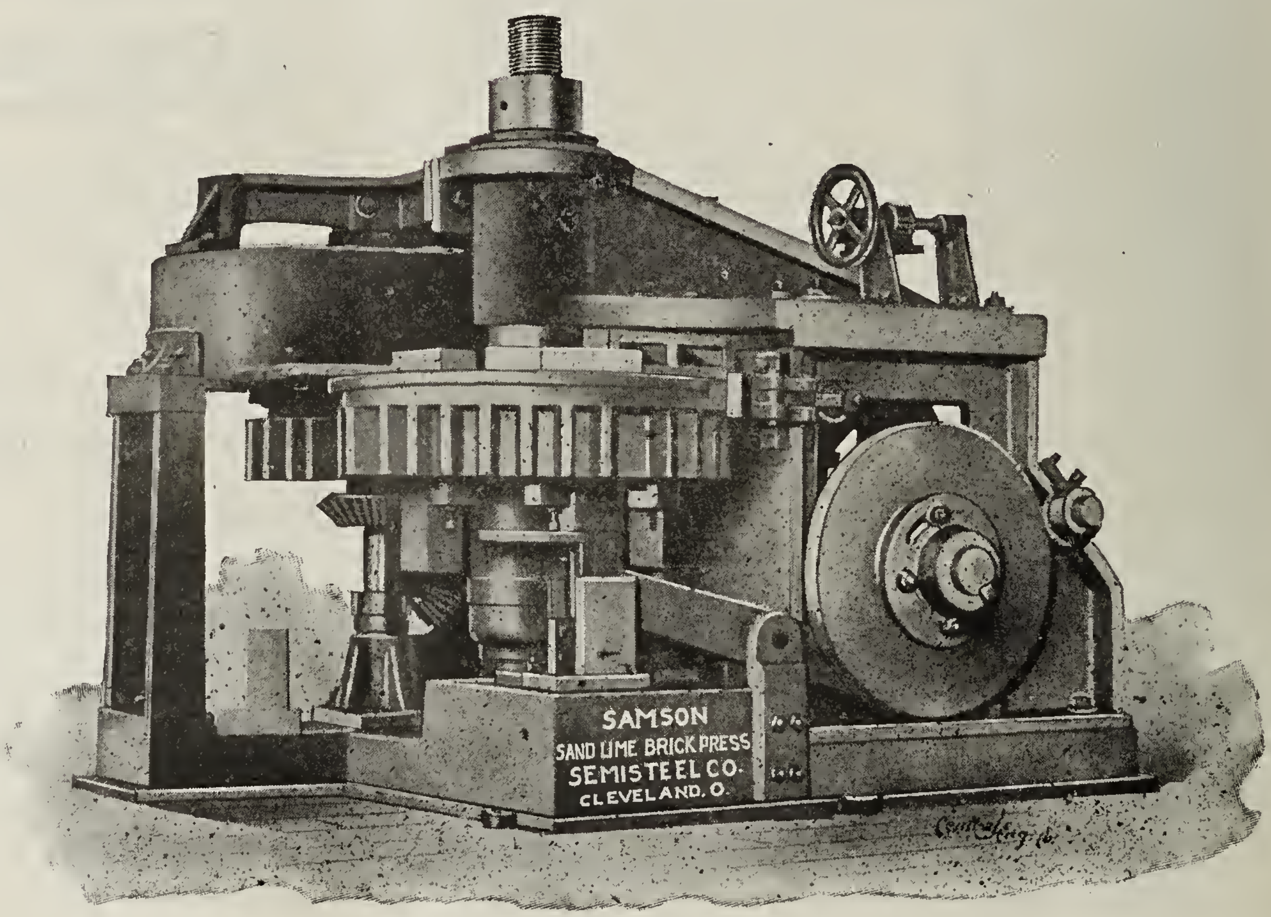

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Received from the Jury of Awards at the Louisiana Purchase Exposition the highest award for excellence of sand-lime brick.

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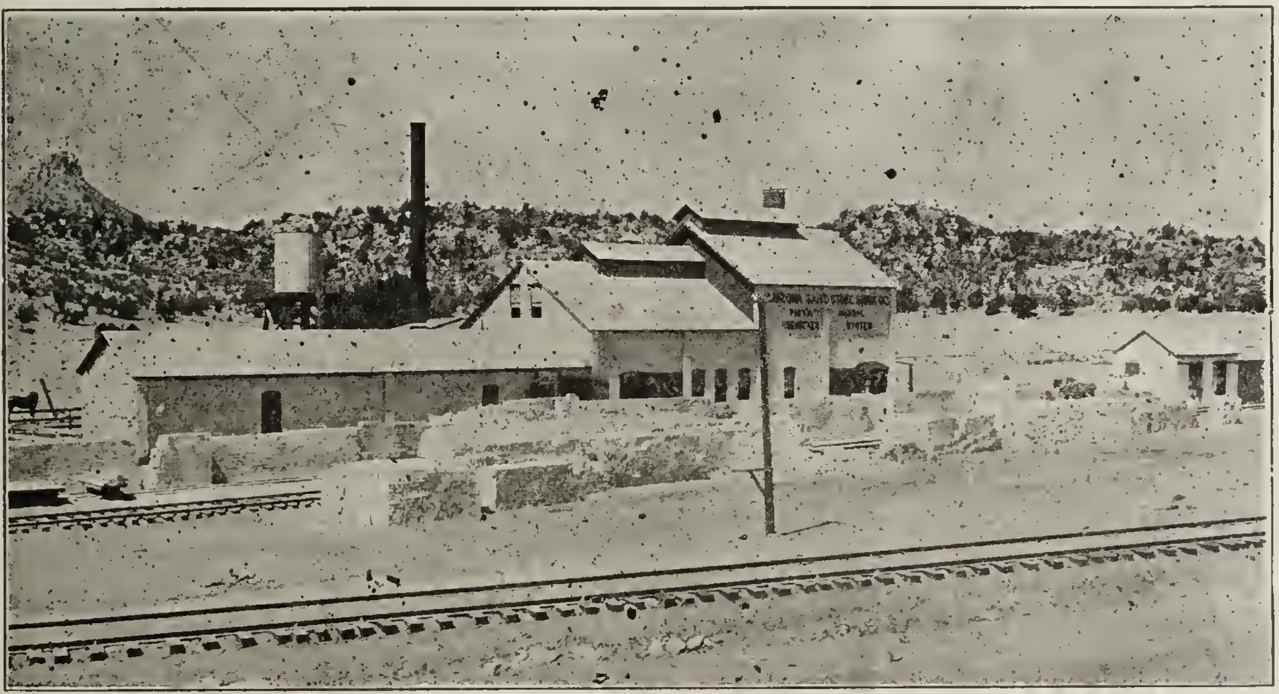

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OR

DRAIN TILE

We also manufacture **MACHINERY** for
different clay working and manipulation.

Dry and Wet Pans, Clay Mills, Combination Mills, Elevators, Screens, Trucks and Wagons. PRESSES for Nozzles, Sleeves and Runner Brick for Bessemer Steel Process. Tuyere Presses, etc. DIES for Wall Coping, Flues, Roofing, Traps, etc.

Write for Prices and Terms,
stating capacities wanted.

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CUYAHOGA FALLS, OHIO, U. S. A.

Nine Foot Iron Frame
DRY PAN

With Independent
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MULLERS

A well-tried and
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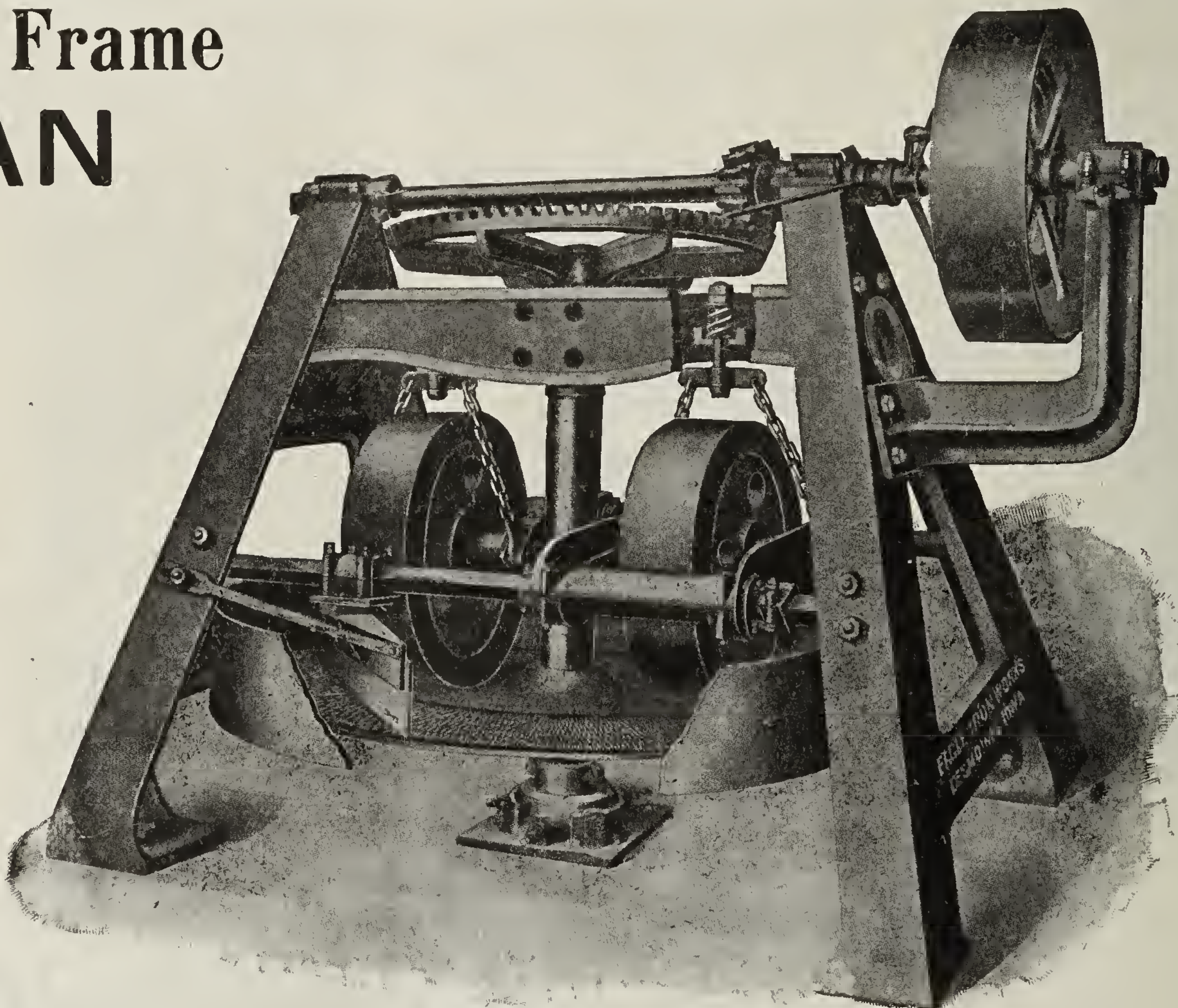

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ORDERS FOR PERFECT CLAY SCREEN

are proving our claims, as our record of sales for one week are fifteen screens. Thirteen of these were for old customers while two were for new ones. If our old customers were so well pleased, why can we not do as much for you?

If you use a screen we claim we can save you money by using ours.

DOES NOT THIS RECORD OF SALES PROVE OUR CLAIM.

We guarantee satisfaction, let us show you what we can do. Our new catalog for the asking.

DUNLAP MFG. CO.,
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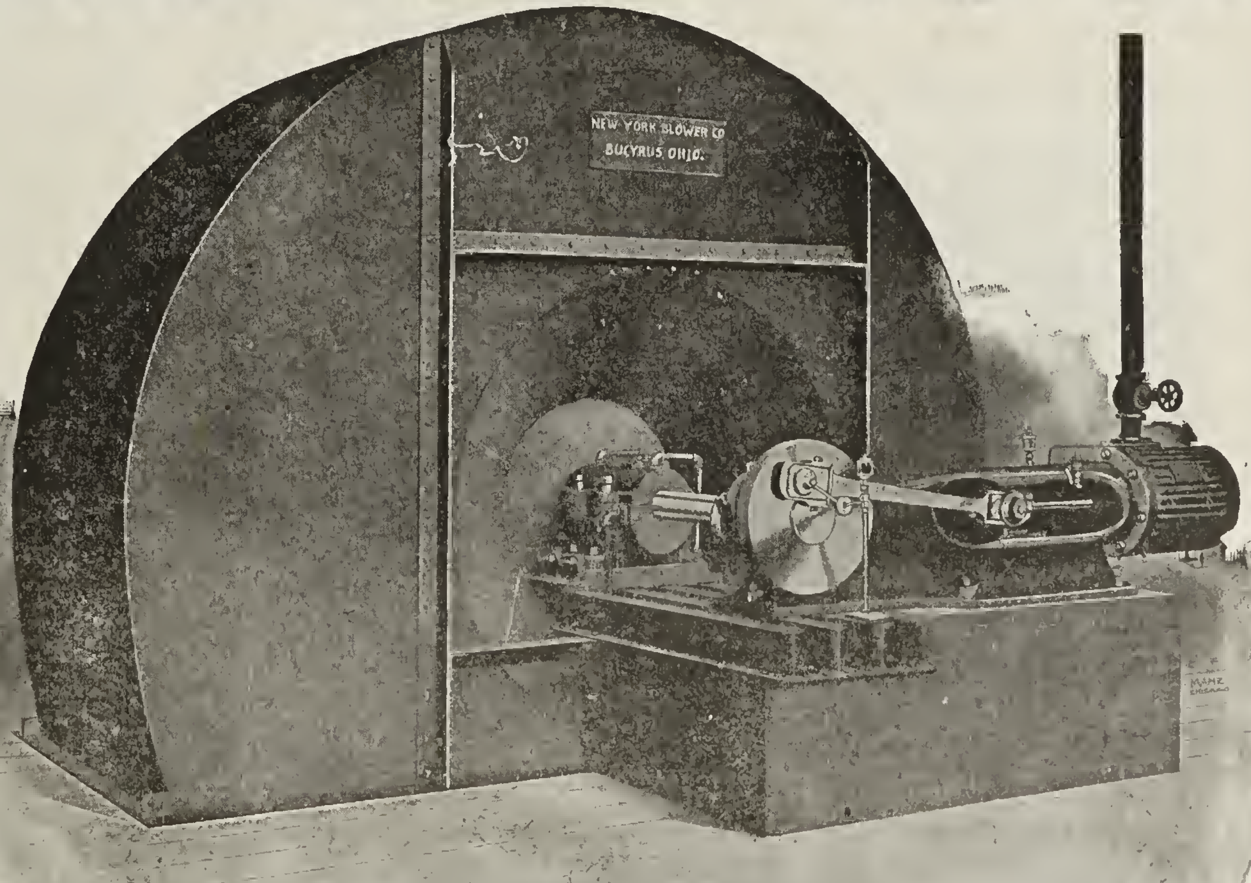
WASTE HEAT CLAY DRYER.

We offer the New York Blower Company's Improved Waste Heat Dryer as the most successful means of utilizing the heat from the cooling kilns which is at present an absolute waste. The two important factors in drying are heat and circulation of air; one being as important as the other. These are both amply provided for in our dryer. By the use of mixing chamber, provided with the proper dampers fresh air can be admitted to the fan to reduce the temperature of the incoming gases to the proper degree. By changing the speed of the fan the amount of air blown into the tunnels is easily regulated. With this apparatus, by which you can readily regulate and control the heat and circulation, you have a dryer which will work successfully in all climates and temperatures The necessity of perfect circulation in a dryer should never be overlooked. With this end in view we provide additional circulating devices in our largest dryers. This maintains an even and positive circulation throughout the dryer and insures the successful drying of your brick.



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NEW YORK BLOWER CO.
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Are you on the **BRICK** road to success? Others are. If **YOU** are not and it is the fault of your **DRYER** let **US** show you the way.

WE CAN DO IT

L. E. RODGERS ENGINEERING COMPANY

WASTE HEAT DRYER SPECIALISTS

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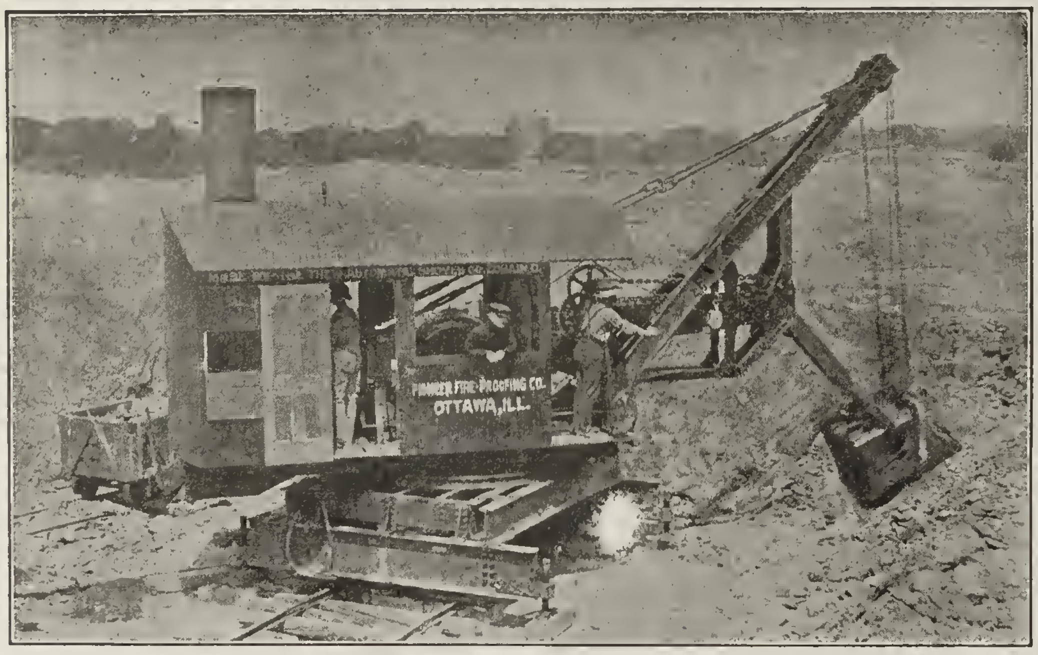
HANDLE YOUR CLAY WITH ONE MAN AND

The Thew Steam Shovels

Made In Four Sizes. Mounted on Car Wheels or Traction Wheels.



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Especially adapted for brickyard requirements. The shovel operates in a complete circle, enabling material to be delivered at side or in rear at will. The Dipper is hung from a horizontally moving carriage and can be adjusted to cut to any desired level.

: : Only One Operator Required.
Wire Cables used instead of Chains.
Strictly First-Class in Every Detail.

Economical for brickyards 30,000 to 40,000 daily capacity.

Operated by one man for outputs up to 125,000 brick per day.

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LORAIN, OHIO.

Operator of Electric Clay Handling System.

Electric Clay Handling System

Clay transported from shovel to plant automatically. The entire system is operated and controlled by ONE man at the hoist and will save its cost in labor in 18 months. All labor between shovel and plant eliminated. Power to generate the electricity taken from any drive shaft. We invite personal inspection of plants in operation.

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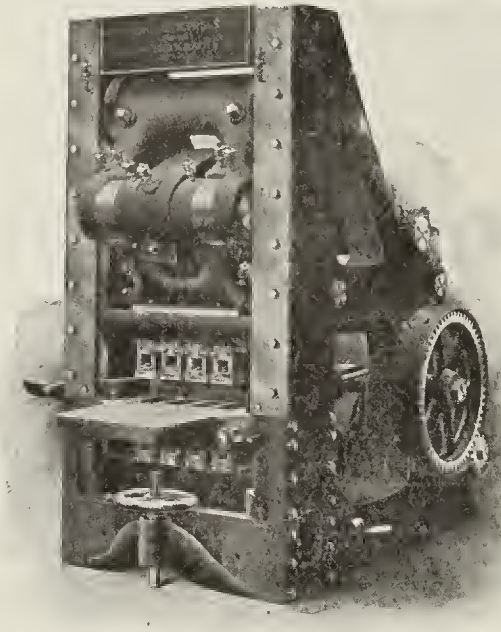

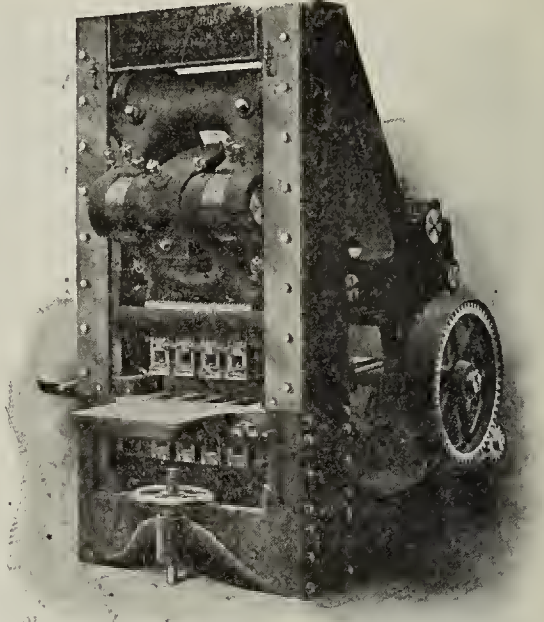

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The BERG for the highest grade of pressed brick of shale or clay. It makes all kinds of shapes and sizes of brick. Changes from one shape to another can be made in less than an hour's time.

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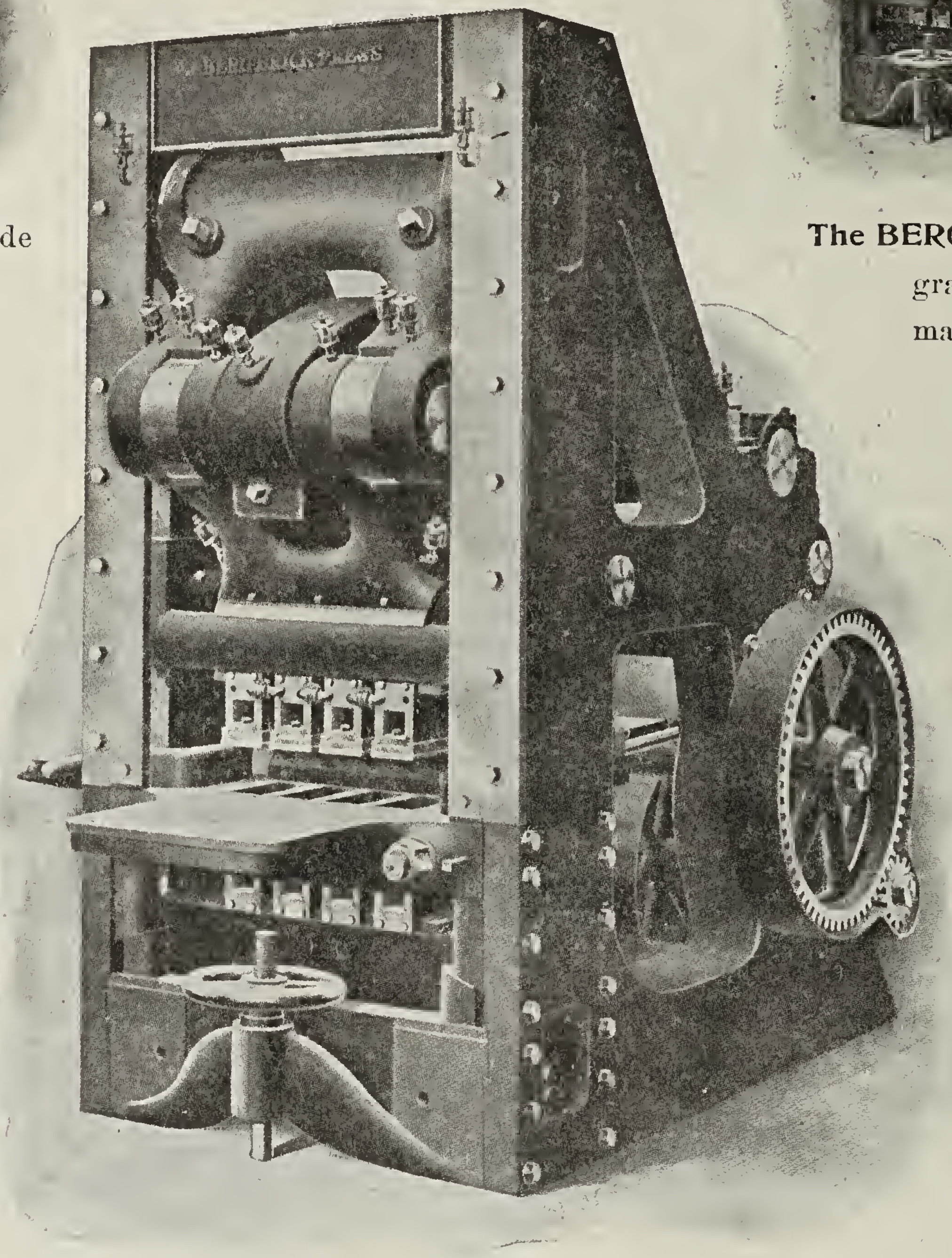

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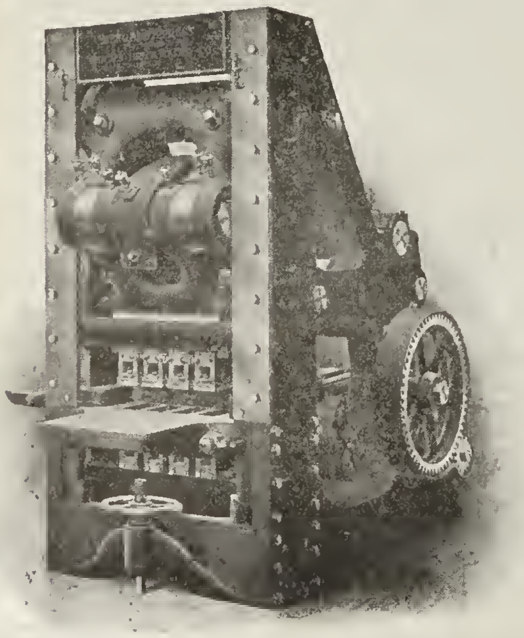

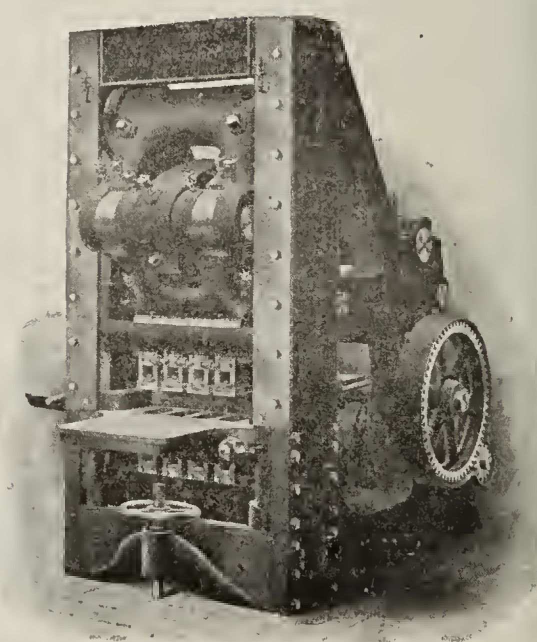

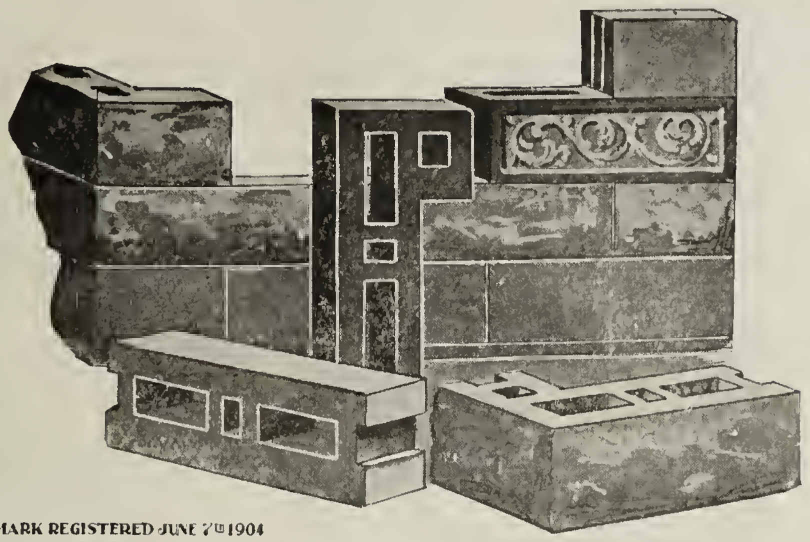

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ALL OF
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ARE COVERED
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TO US AND
NO OTHERS.
FOUR PARTIES
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Report infringing machines to Mr. Frank L. Wolfe, Two Rivers, Wis., Secretary National Organization of Cement Block Makers.

BECAUSE:

It makes all lengths from **four** to **thirty-two** inches.

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It makes all angles for **bay-windows.**

It makes blocks of different contour by removable face plates with patented designs.

It makes **joist** blocks and **nelting-courses.**

It was invented by a **practical** builder who knew what was necessary.

Its proportion as to strength and weight are correct.

It is not a cumbersome and bungling piece of mechanism.

Every block necessary to complete system of construction made by Palmer's machine. No waste.

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Lehmann Portable Continuous Kiln in Combination with Drying Floors...

CHEAPEST AND SIMPLEST CONTINUOUS KILN ON THE MARKET

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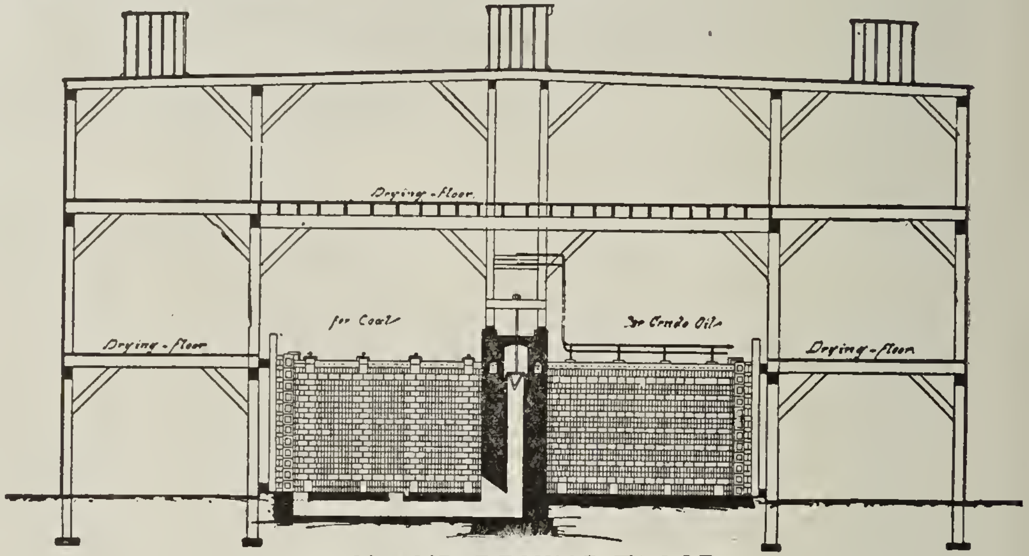

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Lehmann Crude Oil Burning Apparatus

First successful attempt to burn Crude Oil in a Continuous Kiln; can be applied to any system.

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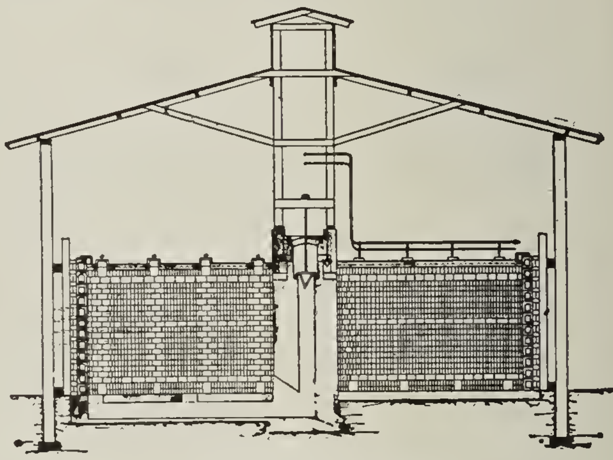
Can be made and adapted to any kind of clay at the place of manufacture, and insures uniformity of size of manufactured goods.



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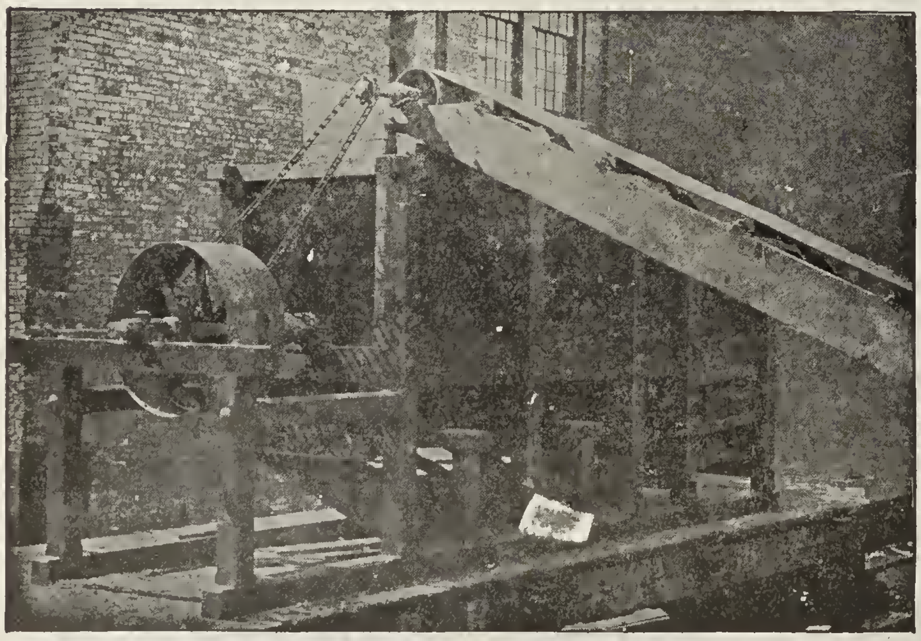

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MOST PRACTICAL, SIMPLE AND EFFECTIVE

The slumming process is the most economical and the only reliable method for removing gravel and other foreign matter from Common Clay, Kaolin, Chalk, Mineral Paints, etc.

ALL THESE DEVICES HAVE BEEN TRIED THOROUGHLY AND SUCCESSFULLY.

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THE BEST
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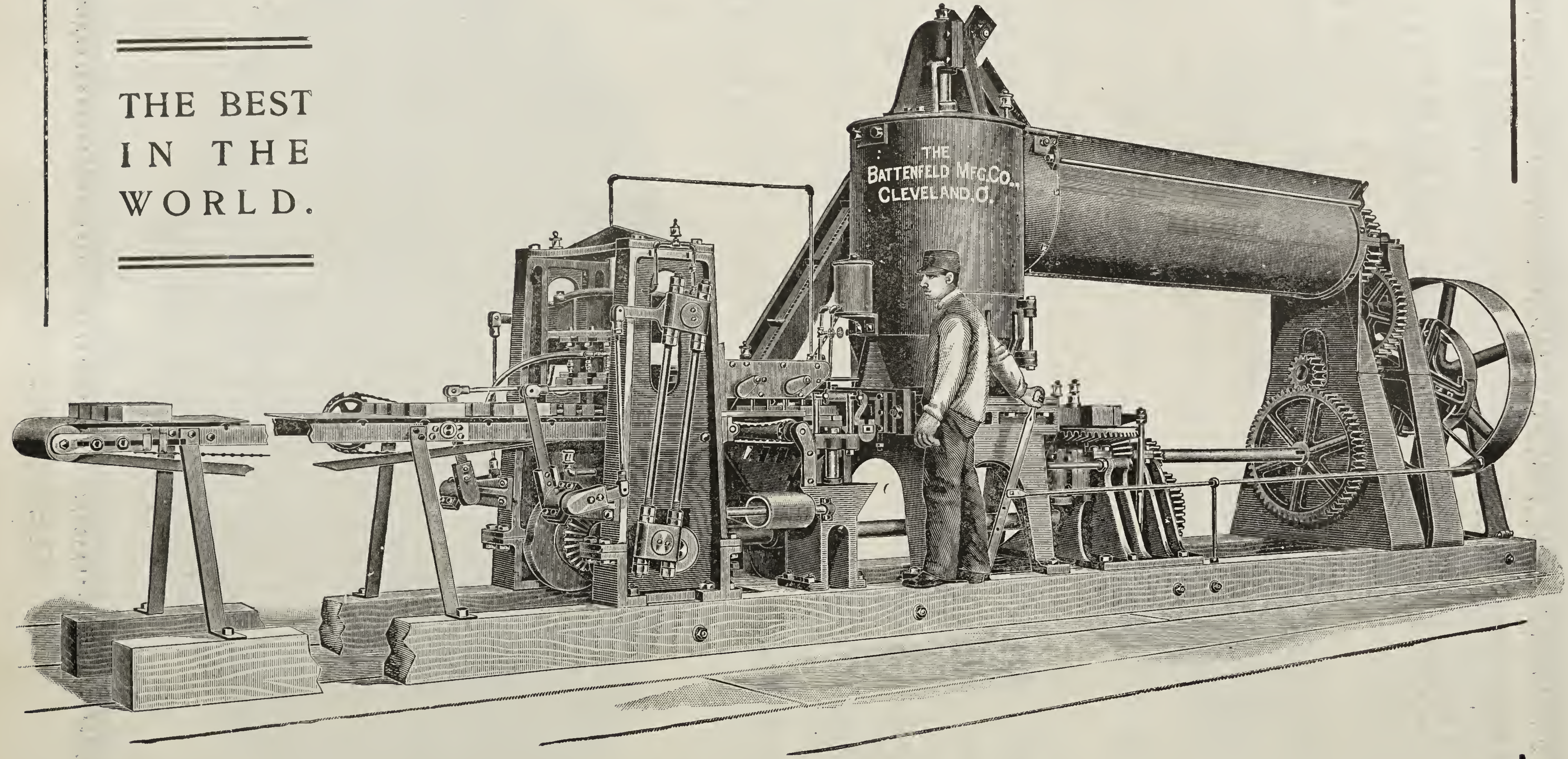
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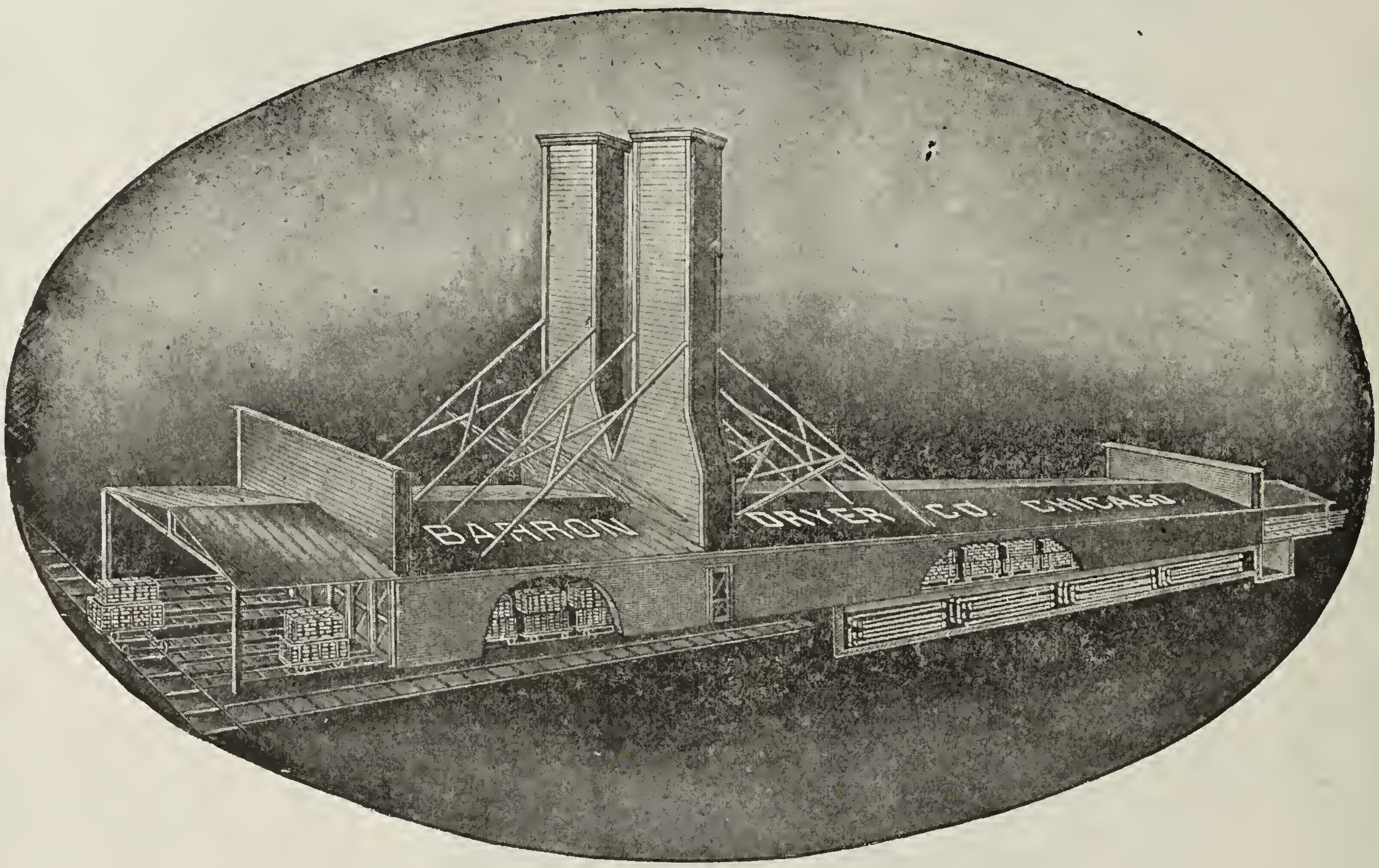

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You know that the brickmakers who are making the money in these days are those who have installed an up-to-date drying system enabling them to cope with ease with the heaviest demands of the market, their operations being uninterrupted all the year round.

This is true of them, what of your case? Why adhere still to antiquated methods subjected to weather limitations. Determine to install the most effective drying system in existence and apply for information and quotations to the

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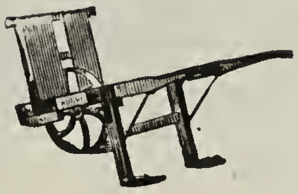
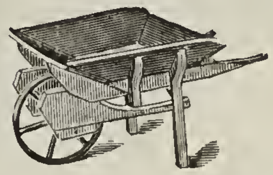
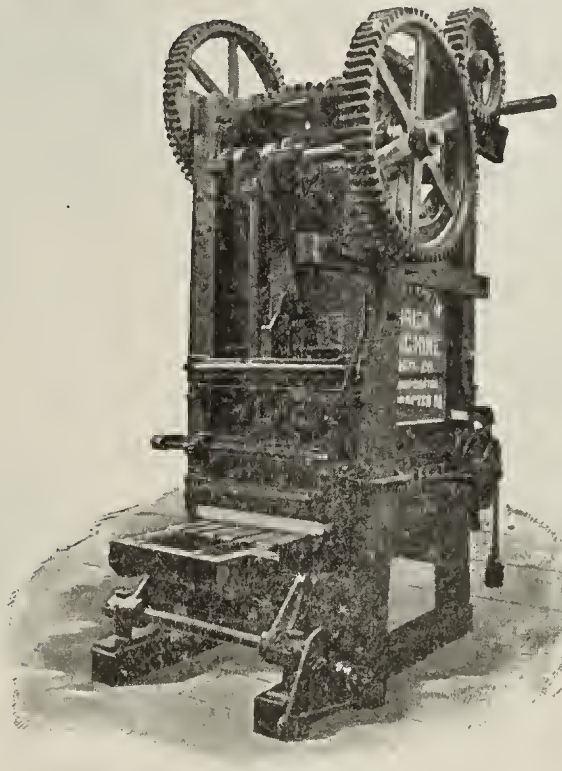
THE BEST IS THE CHEAPEST IN THE END



The Machine that "makes good" Brick





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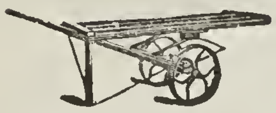

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MARTIN

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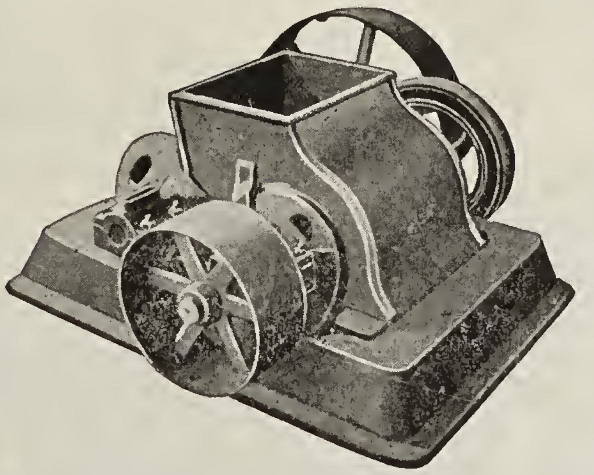

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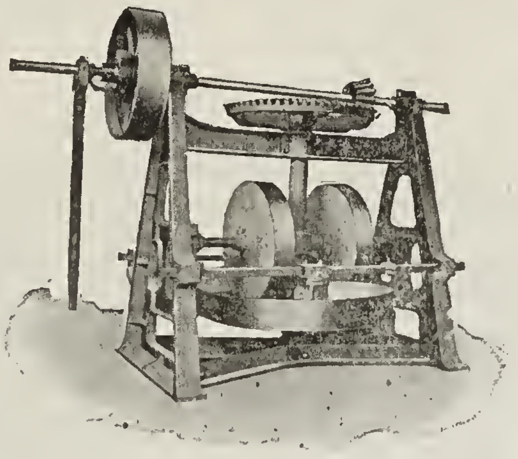

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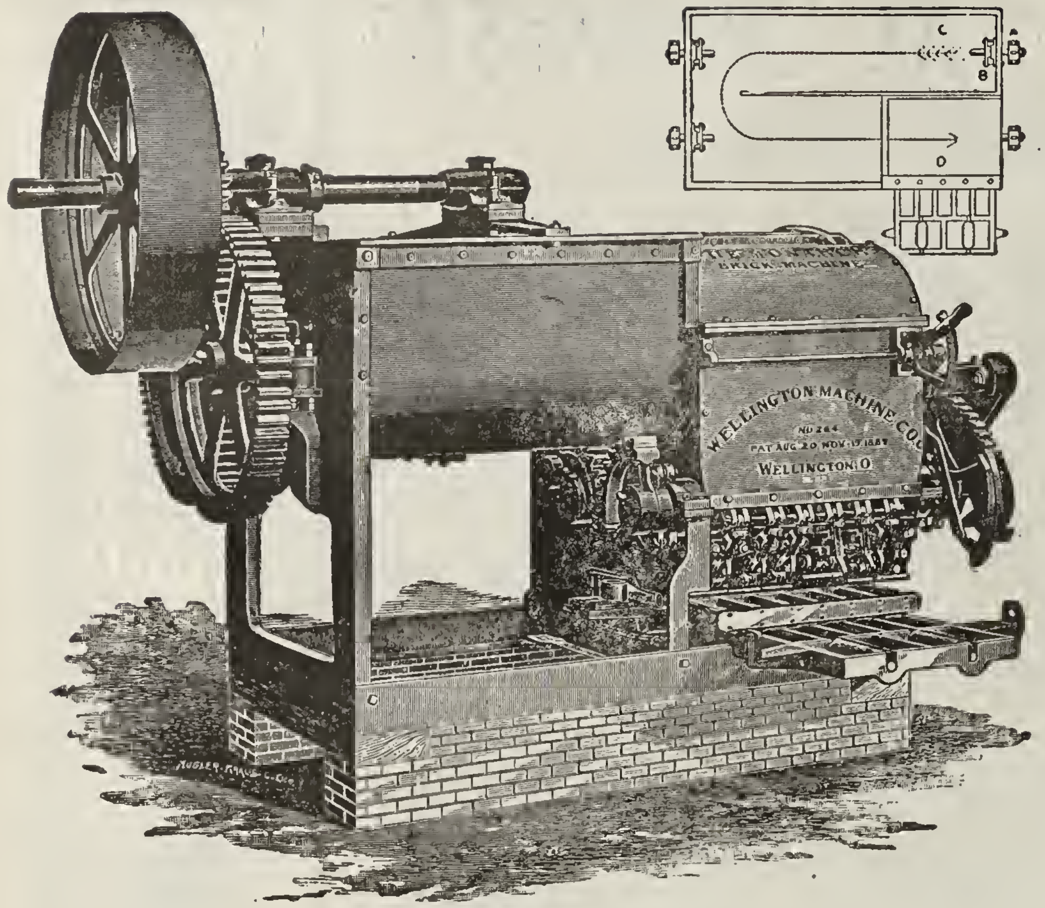

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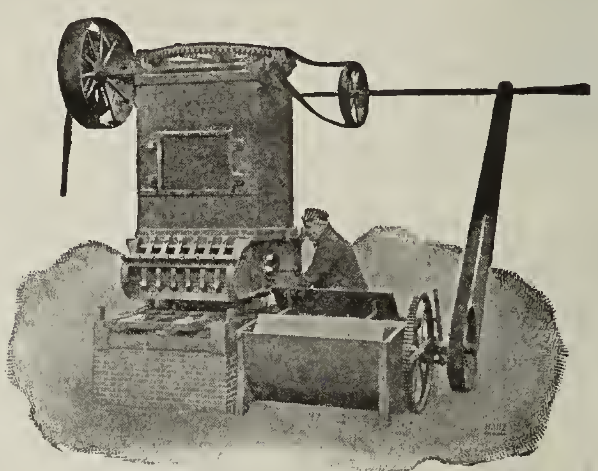

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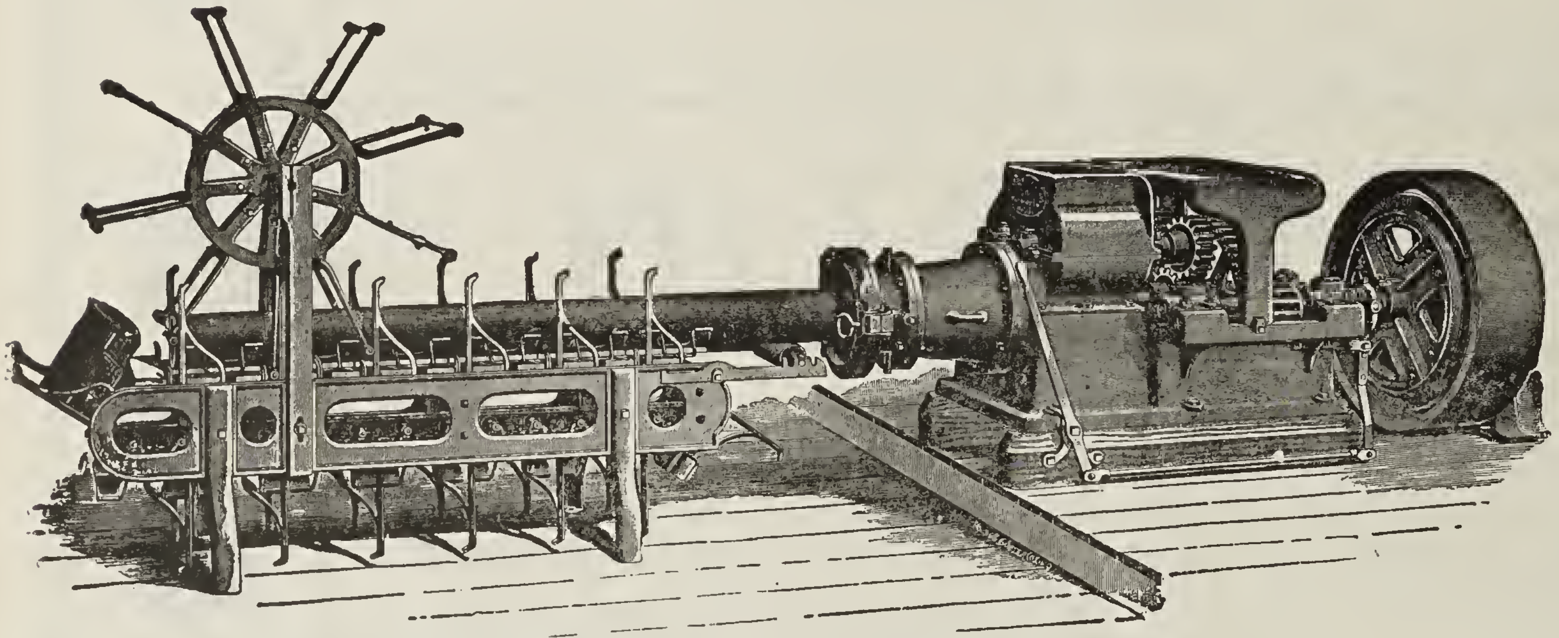

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THE PREMIER BRICK MACHINE
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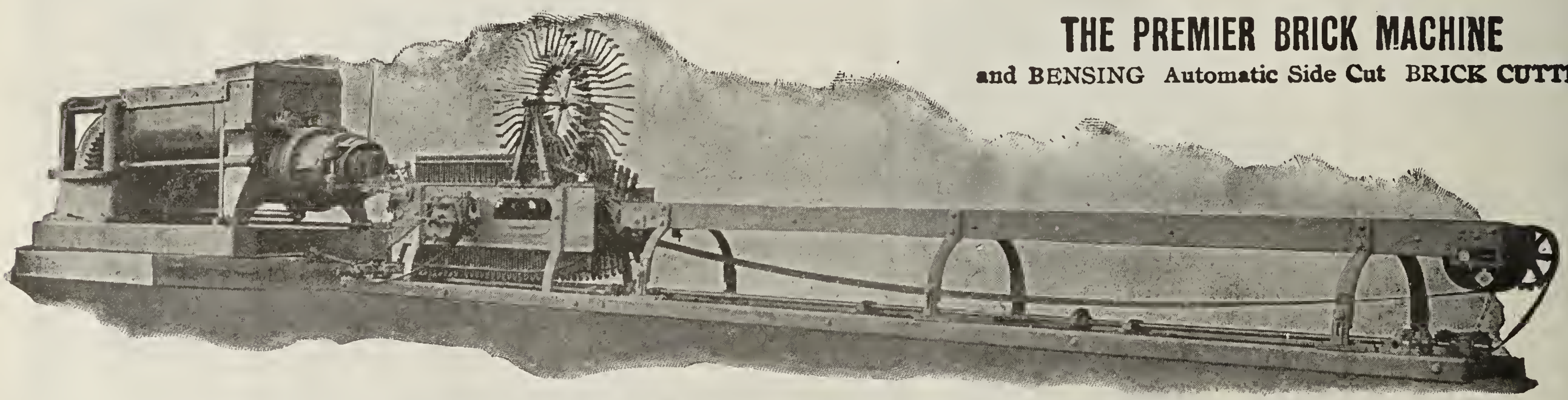

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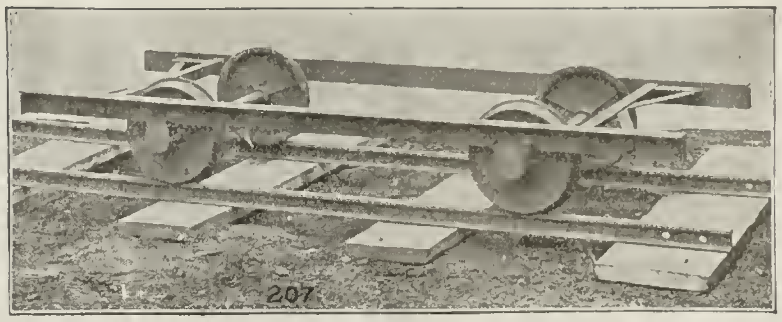

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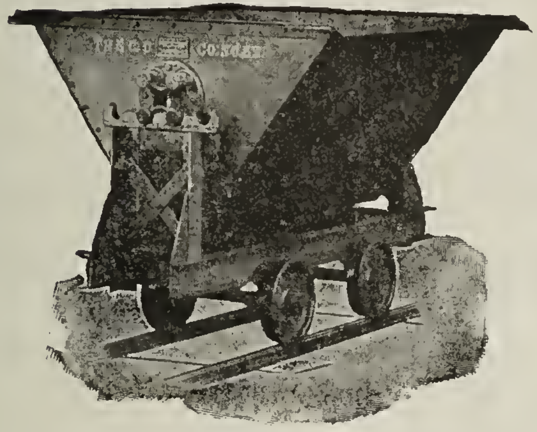

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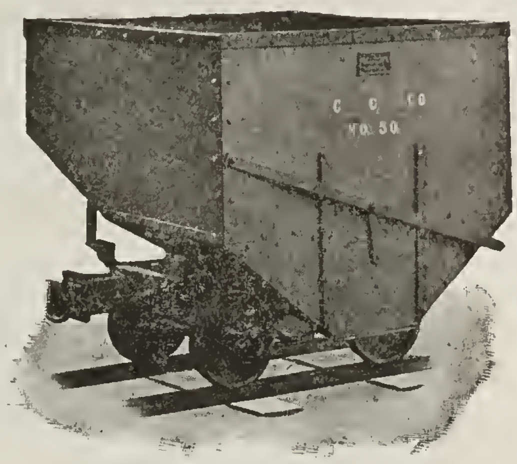

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For Dumping Into Dry Pans, Disintegrators and Crushers.

Dryer Cars of Every Description, Dump Cars, Turn Tables, Transfer Cars, Switches, Frogs, Rails, Etc.

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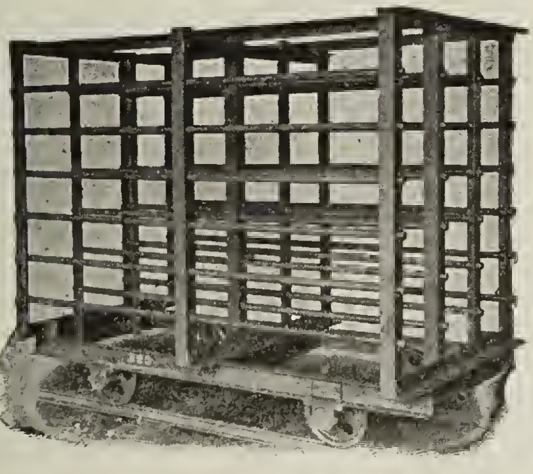

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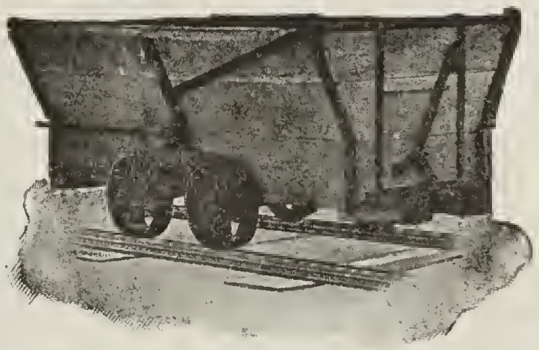

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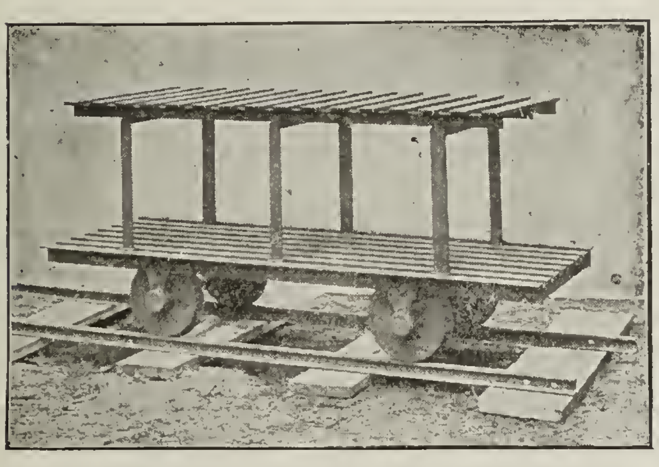

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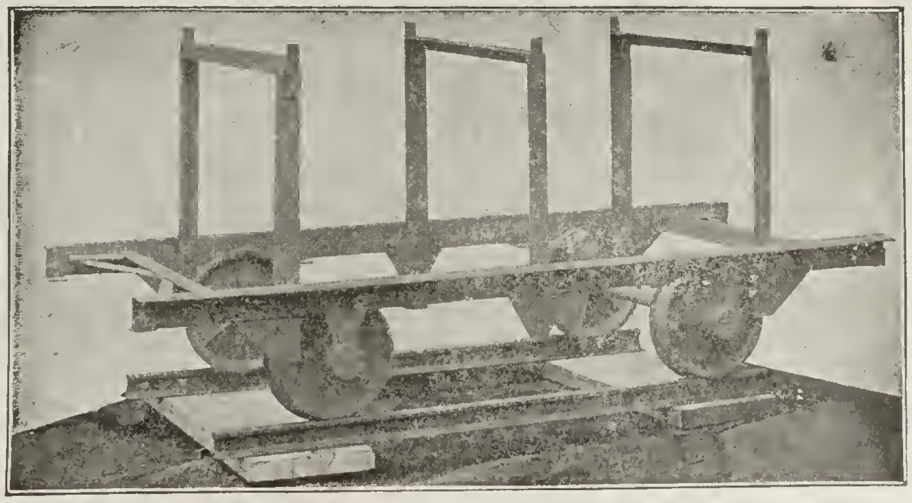
For Brick, Tile, Fire-Proofing, Etc.



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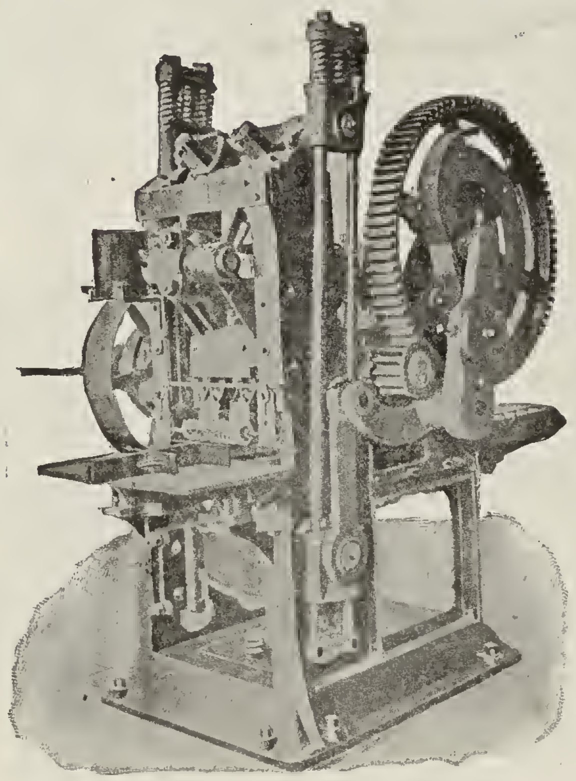

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HAS NEVER BEEN REPLACED by one of another make.

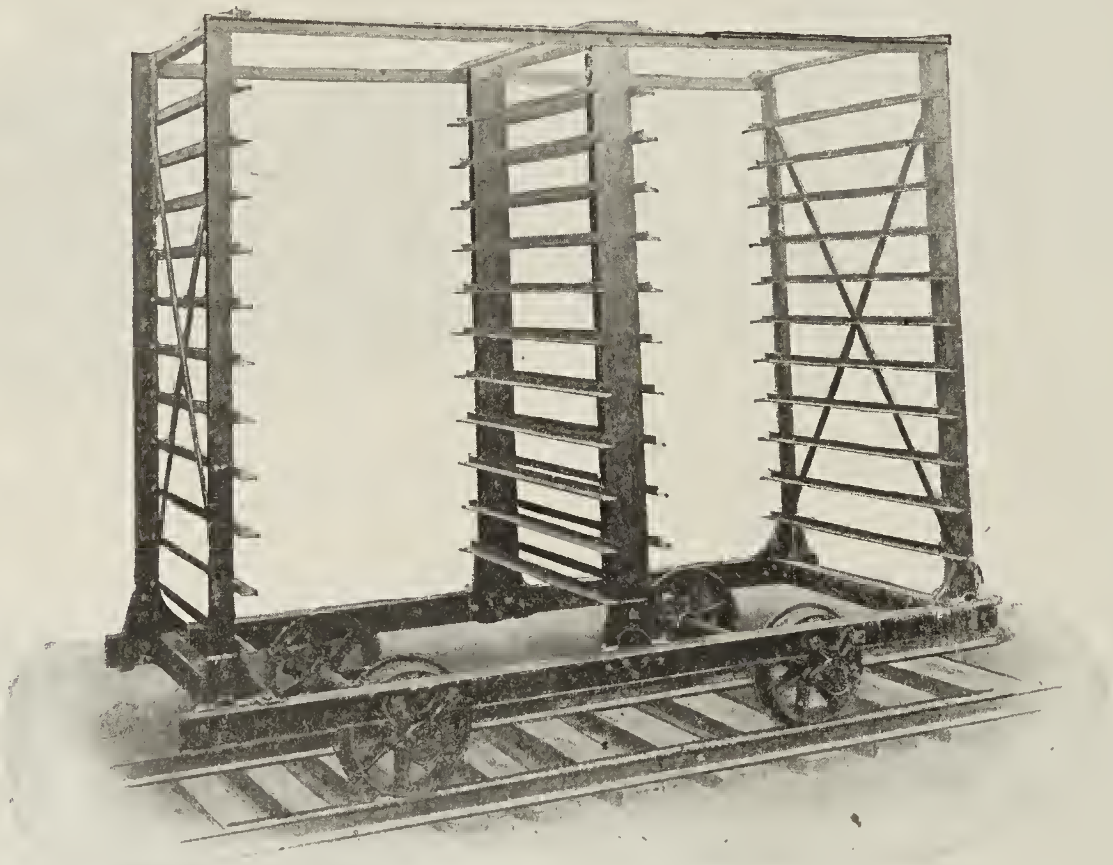
This is a fact that we think it not improper to boast of.

Do you not agree with us and is this not the repress you want in your plant?

"We also have another boast coming." We never had any of our dryer cars rejected.

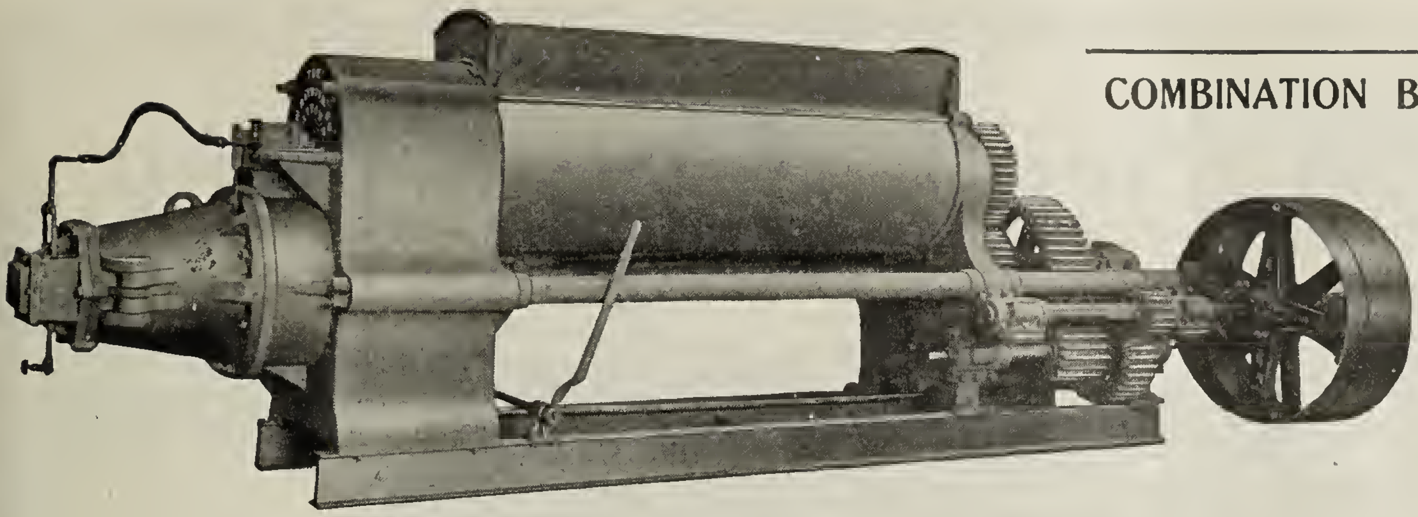
They are fit companions for our repress.

We are prepared to furnish you any machinery you want or will build your plant complete.



Soft Mud Rack Car.

The Ohio Ceramic Engineering Company
Cleveland, Ohio.



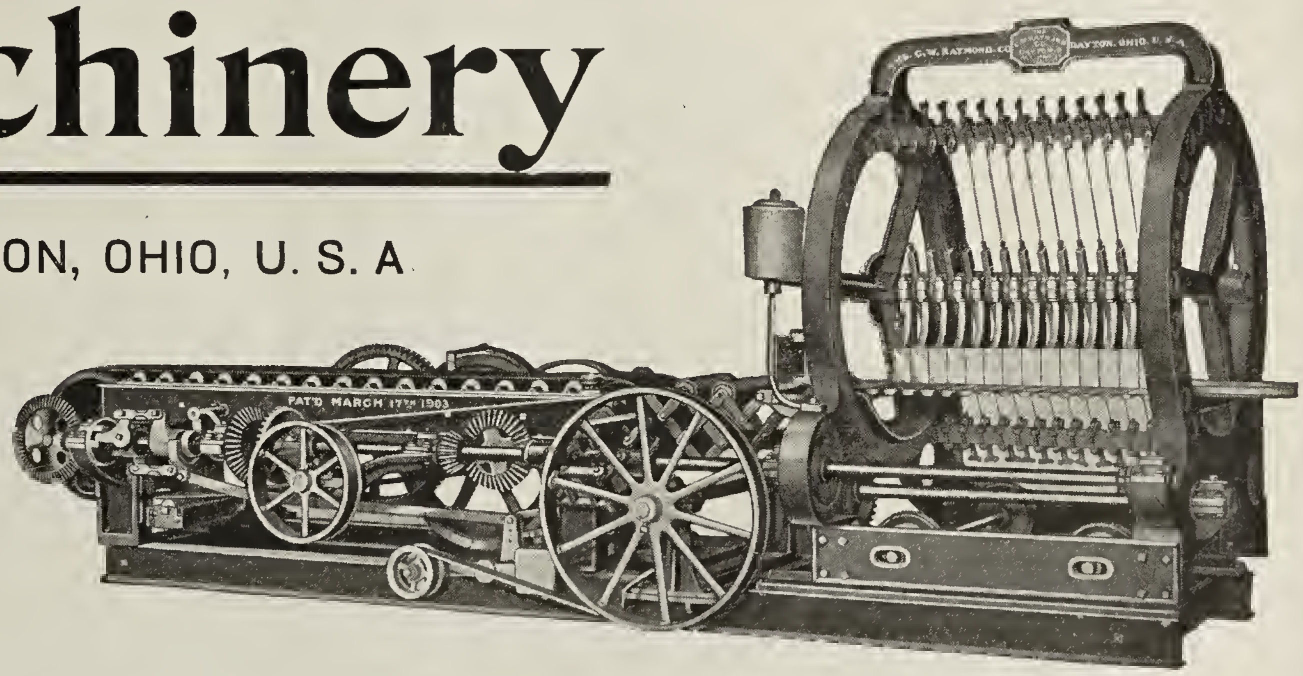
COMBINATION BRICK MACHINE

THE
C. W. RAYMOND CO

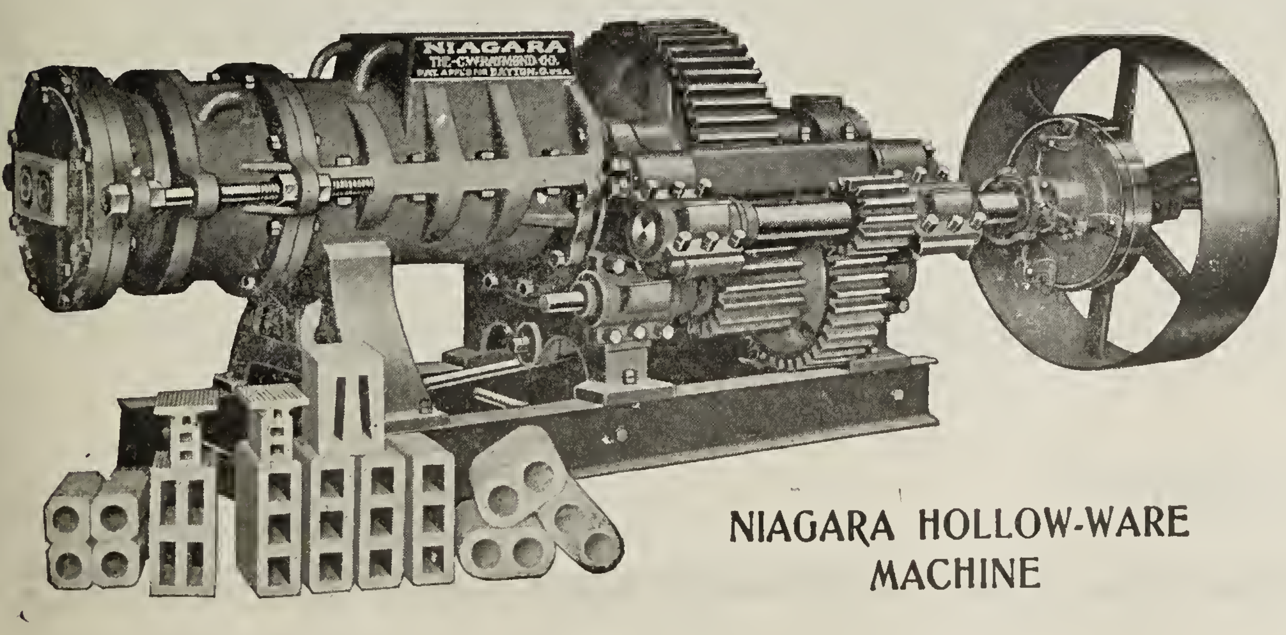
Clay-Working Machinery

DAYTON, OHIO, U. S. A.

NEW YORK
39—41 Cortlandt Street
ST. LOUIS
315 Frisco Building
PITTSBURG
1425 Park Building


THE C. W. RAYMOND CO. DAYTON, OHIO, U. S. A.
PAT'D MARCH 17TH 1903

AUTOMATIC DOWN-CUT CUTTER

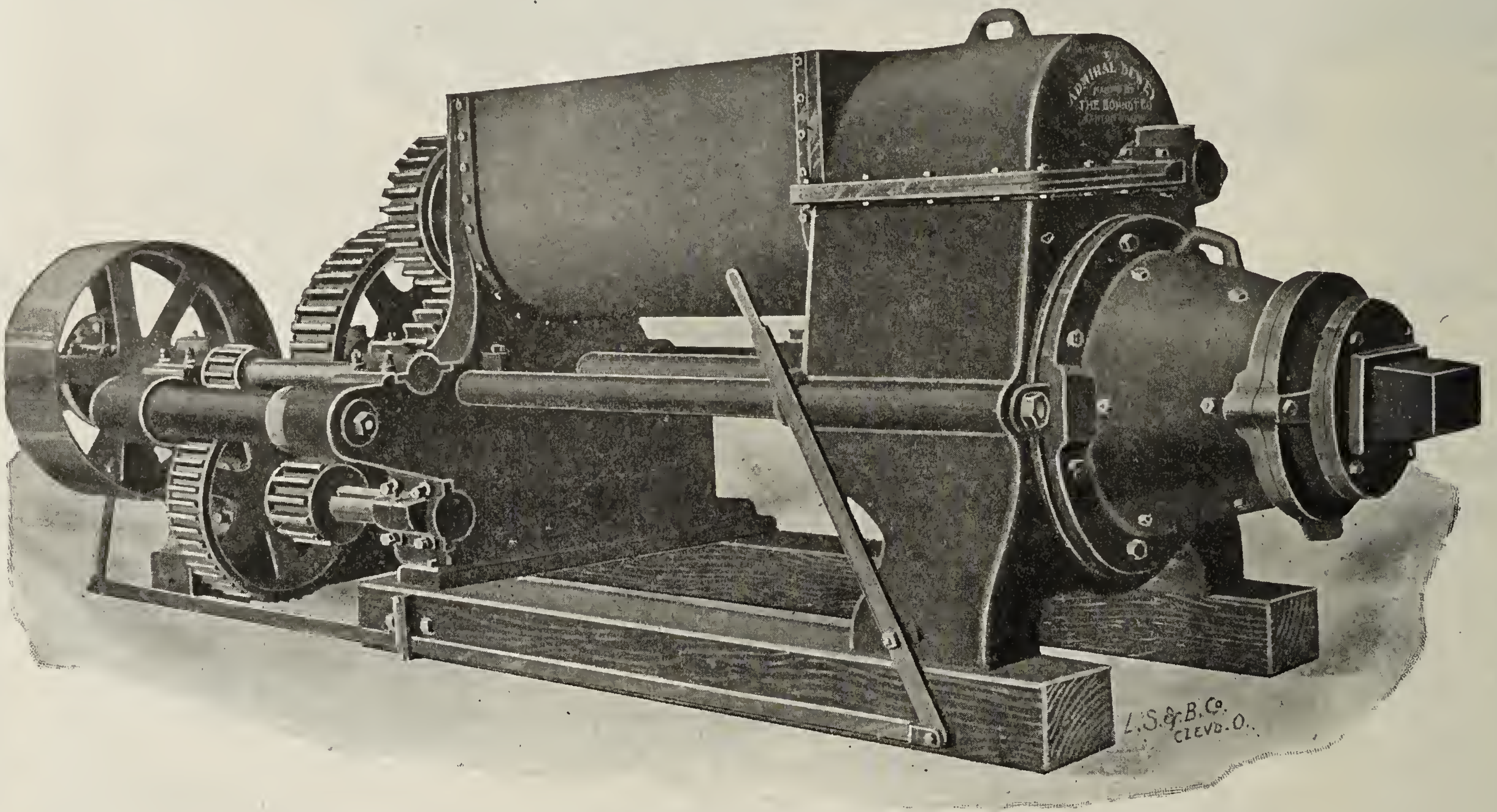

NIAGARA
THE C. W. RAYMOND CO.
PAT. APPL'D FOR DAYTON, O. U.S.A.

NIAGARA HOLLOW-WARE
MACHINE

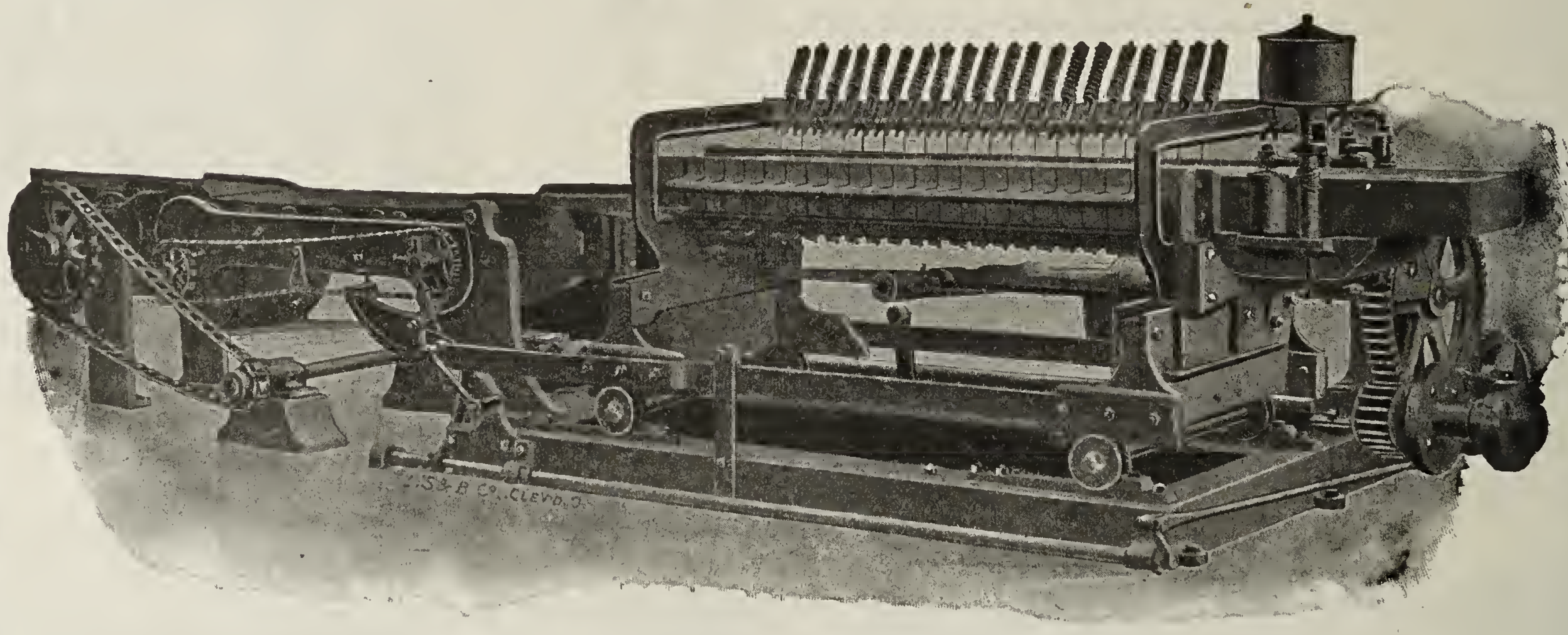
Raymond Machinery
Creates New
Business for the User
Better Brick
and more of them.

CATALOGUE

Modern Brick Machinery



SPECIAL COMBINED BRICK MACHINE AND PUG MILL 100,000 daily capacity.
AUGER BRICK MACHINES 10,000 to 100,000 capacity, five sizes.



AUTOMATIC SIDE CUT TABLE. Simple, positive, durable.

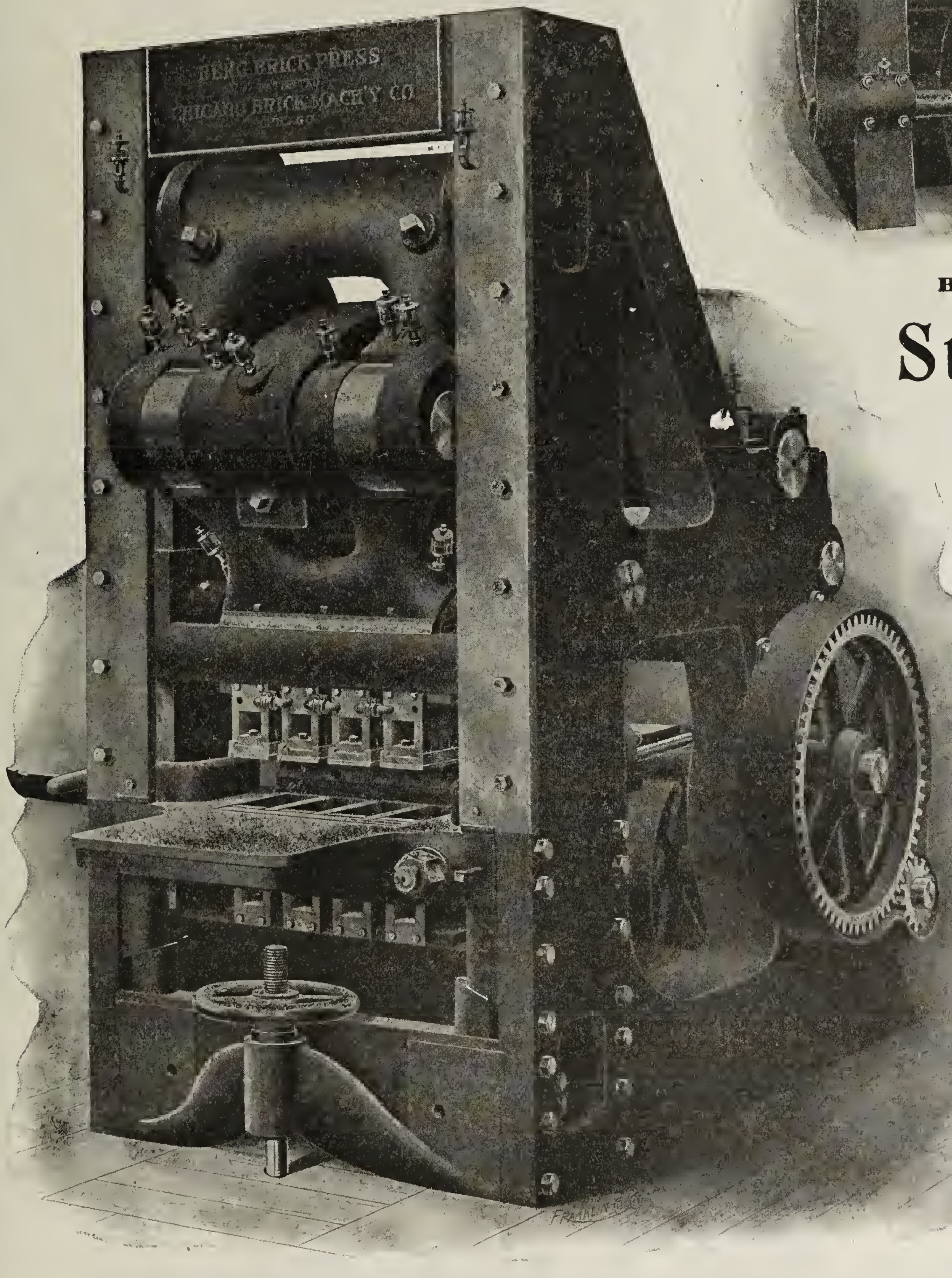
COMPLETE EQUIPMENTS FOR BRICKMAKERS. *ASK FOR CATALOGUE.*

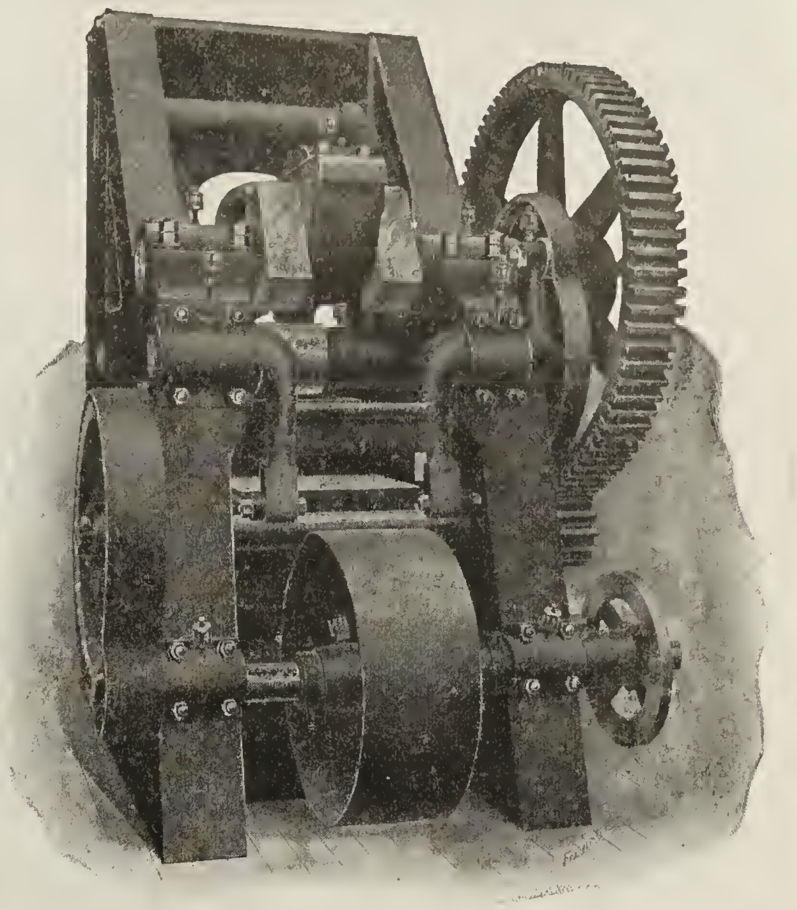
THE BONNOT COMPANY, Canton, Ohio.

—WESTERN AGENTS—

CHICAGO BRICK MACHINERY CO., - - 77 Jackson Boulevard, Chicago, Ill.

NEW MODEL BERG BRICK PRESS





Back View.

Still in the Lead

AND

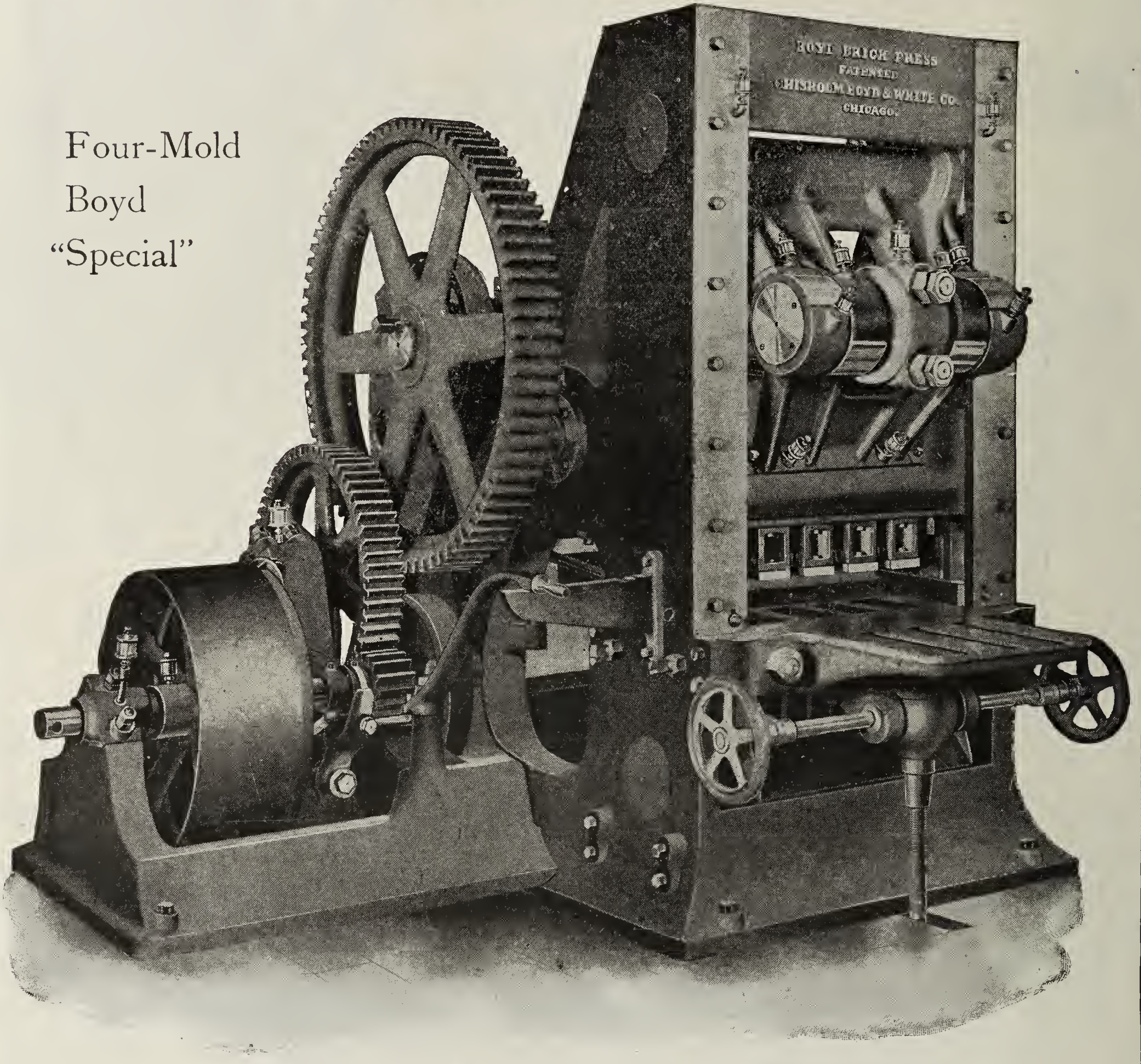
One Step Further Forward

Even stronger than ever and all self-contained. Greater pressure and fewer working parts than any other machine. Simple, massive, compact. Running mechanism placed in rear, as shown in upper cut, enabling this machine to be SHIPPED IN ONE PIECE.

MANUFACTURED BY
ANDERSON FOUNDRY & MACHINE WORKS
Anderson, Indiana.

SOLD BY
CHICAGO BRICK MACHINERY COMPANY
77 Jackson Boulevard, Chicago.

The Boyd Brick Press



Four-Mold
Boyd
"Special"

A Business Proposition.

We will send to any responsible party a **BOYD BRICK PRESS ON TRIAL** and subject to purchase after the making and burning of one or more kilns of brick. We take the machine back if not satisfactory.

THE BOYD BRICK PRESS exerts greater pressure, holds it longer, puts more clay into brick, and makes stronger brick than any other Brick Press made. Especially adapted for working shales, and is the only successful machine for making fire brick.

ALL BOYD PRESSES are fitted with our IMPROVED PATENTED MOLD BOX, the liners of which are made of the hardest and toughest known metal, which can be reground at low cost when worn. The molds can be changed in a few minutes.

ITS RECORD: More Boyd Presses in actual operation than of all other Press Brick Machines combined. Write for General Catalogue No. 10.

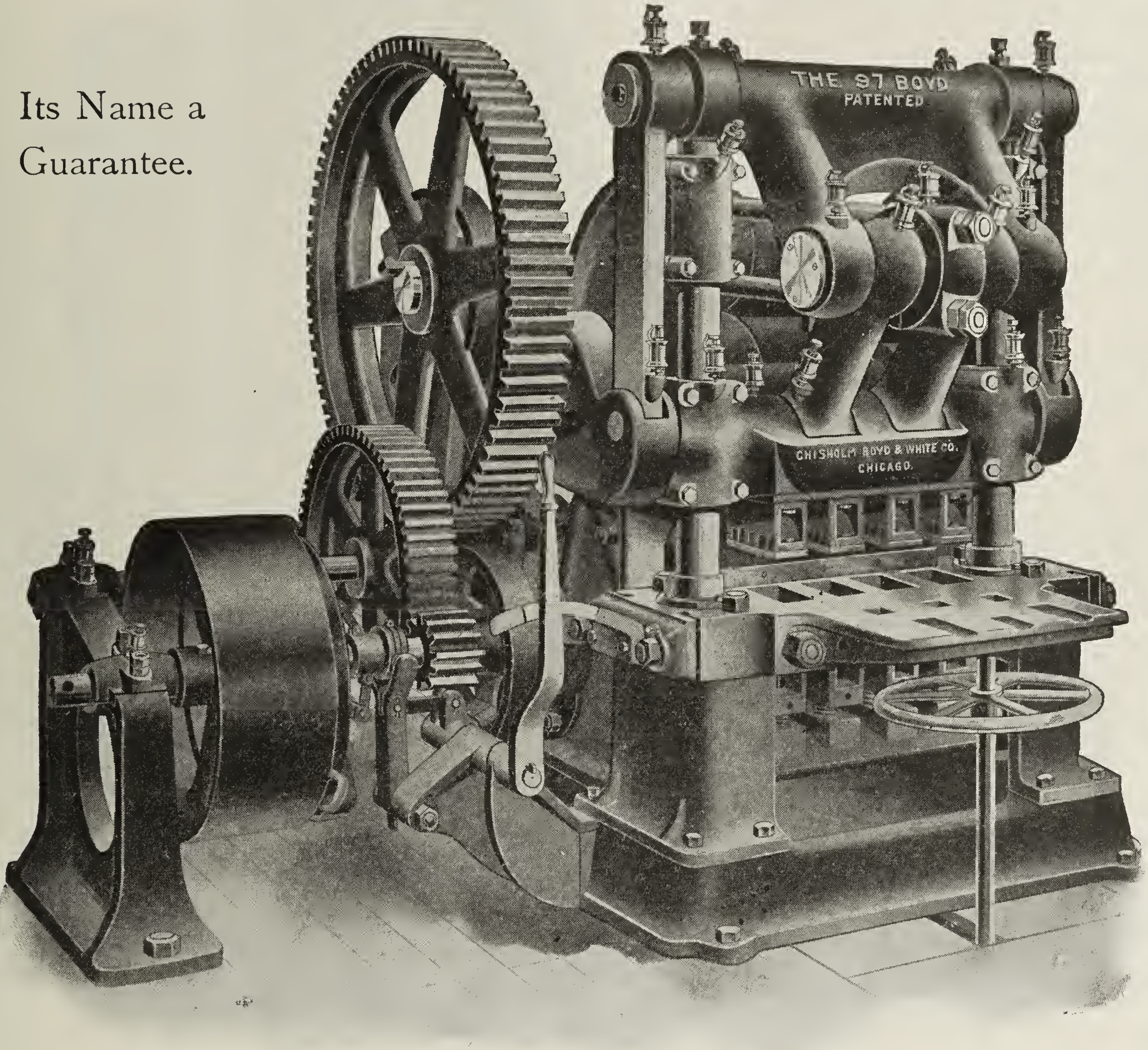
Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

The Boyd Brick Press

The '97 Model

Its Name a
Guarantee.



THE '97 MODEL BOYD BRICK PRESS has enormous strength and great durability; it is compact; the adjustments are convenient; it operates quietly and smoothly; the workmanship and material are of the best; the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking.

THE BOYD is the only Brick Press provided with an independent adjusting device for regulating the amount of clay in the molds and the pressure on the brick. This feature positively ensures equal pressure and finish on both sides of the brick, and no granulated or soft centers.

Sent on trial and fully guaranteed. Seventy presses of this pattern now in use. Cannot be broken in pressing brick. Write for descriptive catalogue No. 9.

Chisholm, Boyd & White Company

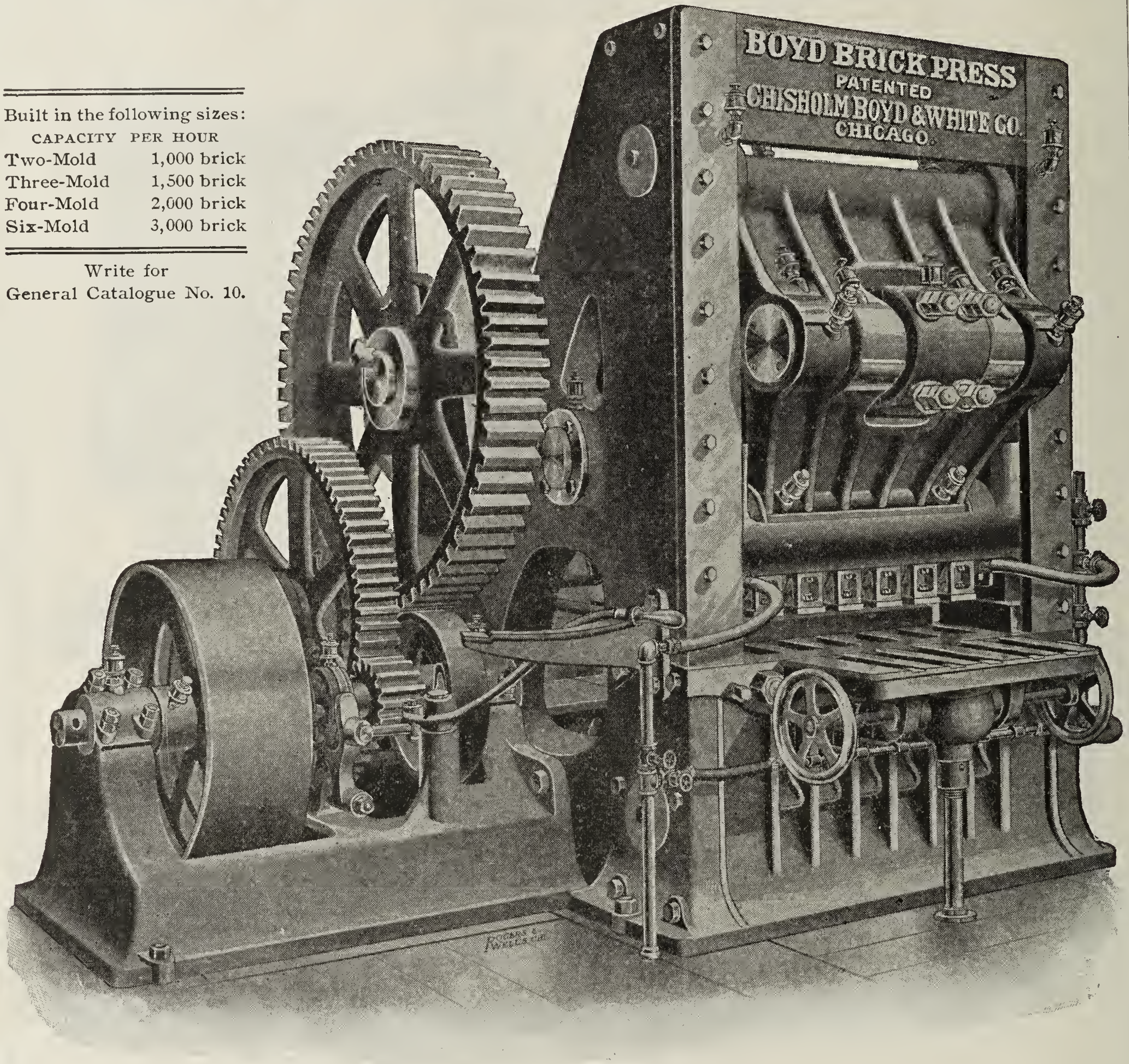
Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

The Boyd Brick Press

Built in the following sizes:

	CAPACITY PER HOUR
Two-Mold	1,000 brick
Three-Mold	1,500 brick
Four-Mold	2,000 brick
Six-Mold	3,000 brick

Write for
General Catalogue No. 10.



Another Record for the Boyd Press:

Six of our SIX-MOLD PRESSES in use on ONE YARD since 1892. Average cost of repairs for each machine One Dollar per year.

THE BOYD PRESS has always been distinguished for originality in design and construction. It will make better brick from clay or shale than can be made from the same material by any other press. It is selected and purchased by the most progressive Brick Makers. The largest and most successful brick plants in the country are using Boyd Presses.

Chisholm, Boyd & White Company

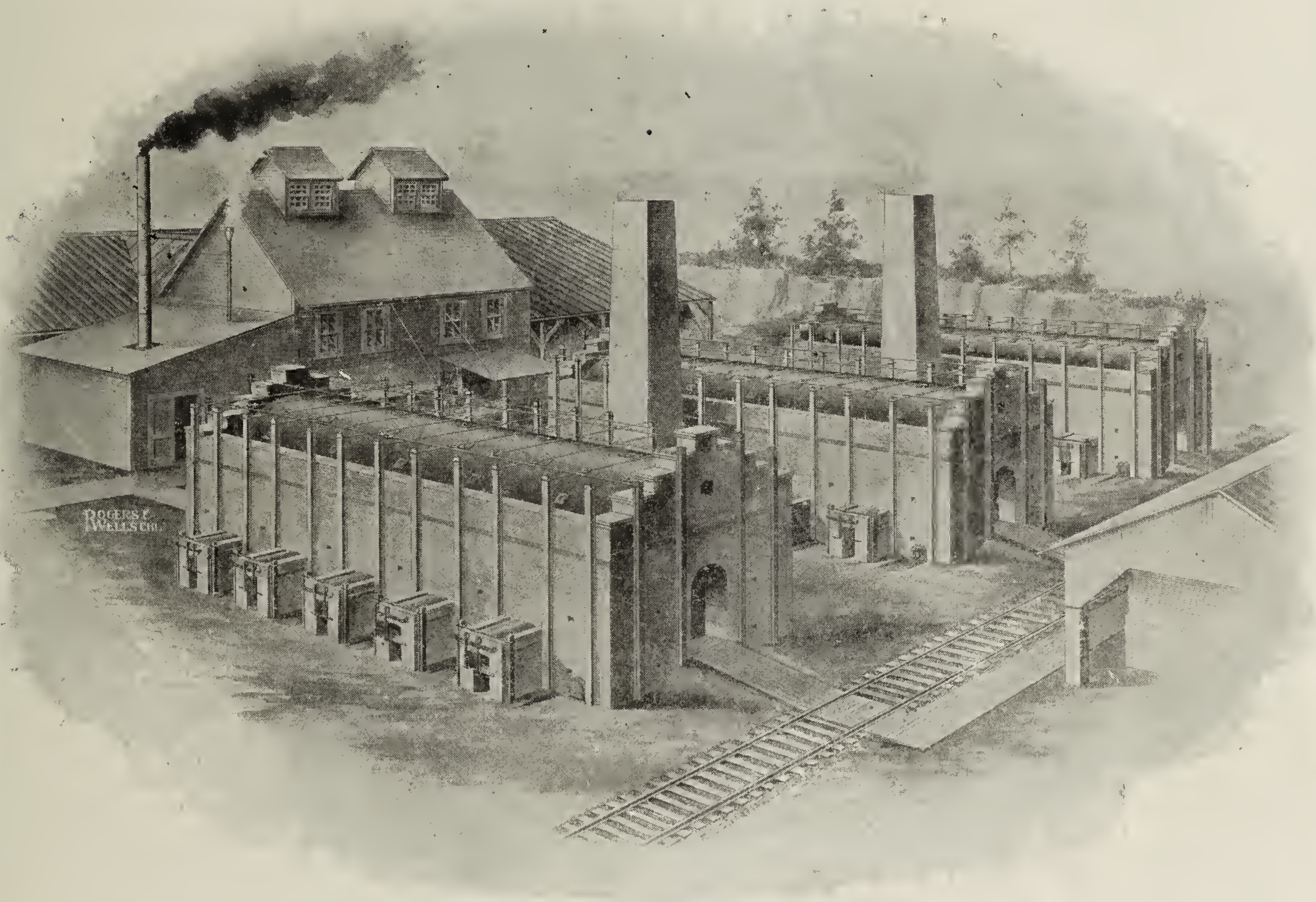
Office and Works, 57th and Wallace Sts. **CHICAGO, ILL.**

Chisholm, Boyd & White Company

Engineers and Contractors for Brick Plants.

MANUFACTURERS OF

The Boyd Brick Press


ROGERS & WELLS CO.

A MODERN BRICK PLANT—As Equipped by us.

A Sure Thing—We design, construct and equip Brick Plants of any desired capacity, furnishing the brickmaking machinery and power plant, erect the necessary buildings and kilns, and turn the plant over to the purchaser in proper working order, under guarantee of satisfactory results.

Brick Plants designed and equipped by us have the highest reputation for efficiency. They are modern, up-to-date, compact, convenient in arrangement, and are not encumbered with unnecessary or useless machinery or appliances.

CORRESPONDENCE SOLICITED.

Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

Adopted and Purchased by the United States Government for use in the Federal Prison at Ft. Leavenworth, Kansas.

Ross-Keller Triple Pressure Brick Machine Co.

SOLE MANUFACTURERS OF THE

"ROSS-KELLER" TRIPLE PRESSURE BRICK MACHINE
"ROSS-KELLER" 44-INCH DISINTEGRATOR

OFFICES:
FULLERTON BUILDING

THIS PRESS HAS AN UNEQUALLED RECORD IN THE MANUFACTURE OF SAND - LIME BRICK.

St. Louis, Mo., U S. A., March 15th, 1905.

ANNOUNCEMENT

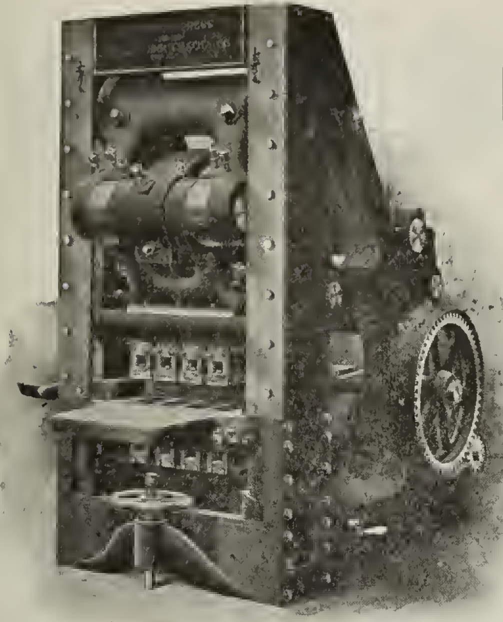
To meet the demand for a lighter ROSS KELLER Press than our Triple Pressure Standard Machine, we have designed and are now building a high-grade four-mould press, weight 30,000 pounds, which we recommend to the trade for clays and soft shales, which do not require as great a pressure as is secured in operating our Standard Machine

Our Standard Triple Pressure Machines (weight 42,000 pounds) are now being successfully operated on Clay, Shale, Sand Lime and Cement Brickyards, and lead all other Dry Presses on the market We have a number of these machines now in process of manufacture, and are in a position to make prompt deliveries.

We guarantee both types of machines to be strictly high-grade and are prepared to make satisfactory prices and terms to manufacturers who are in the market for a dry dress.

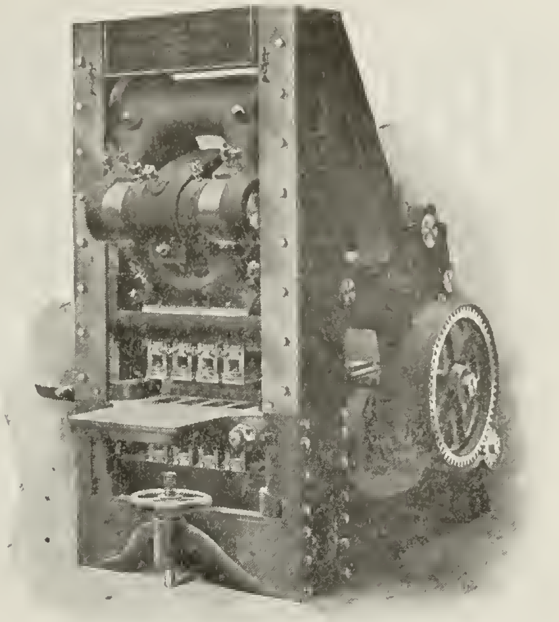
We invite correspondence.

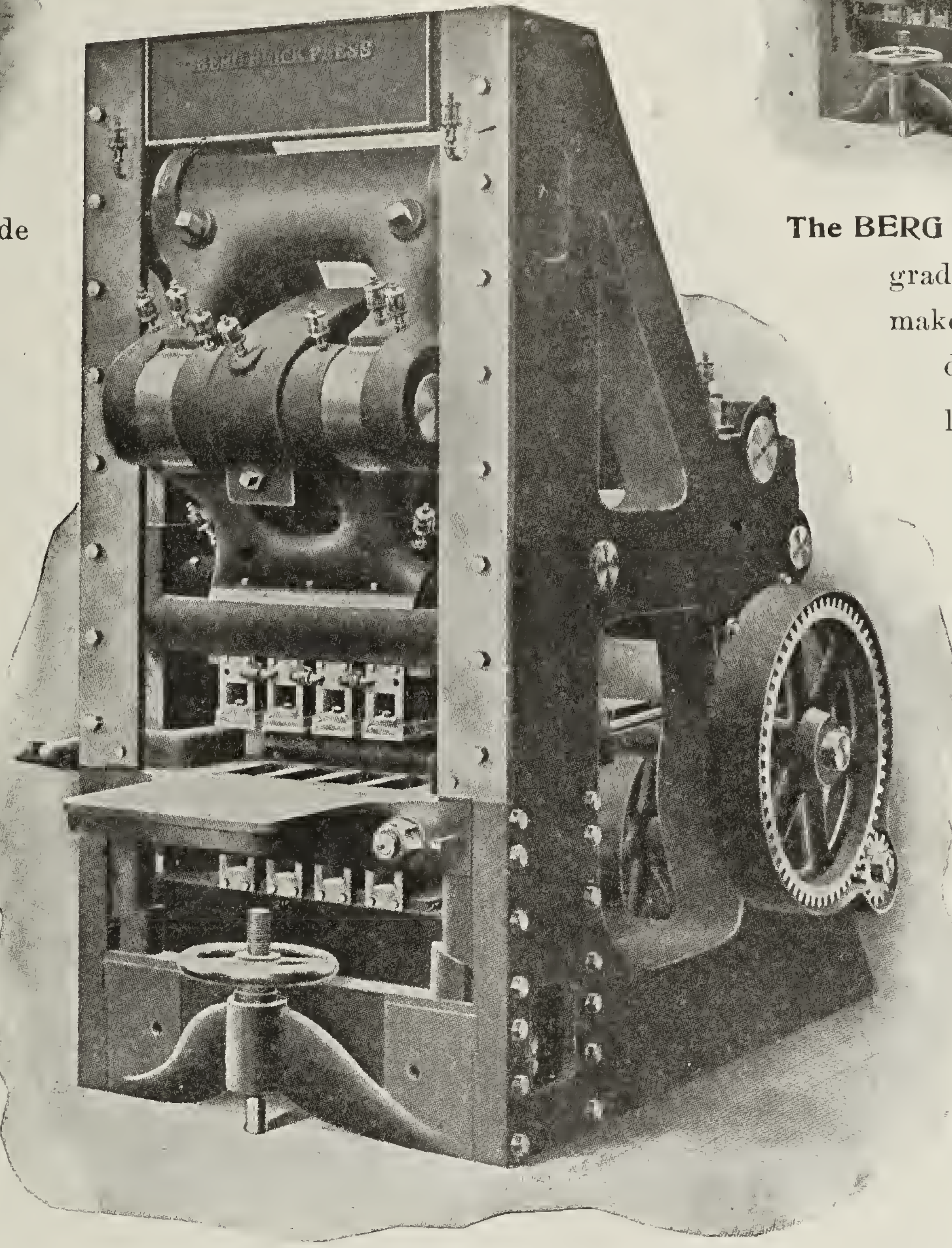
Ross-Keller Triple Pressure Brick Machine Co.
FULLERTON BUILDING, ST. LOUIS, MO



BERG BRICK PRESS

The highest development of the Art of Brickmaking Machinery so pronounced by the United States Government.





The BERG for the highest grade of pressed brick of shale or clay. It makes all kinds of shapes and sizes of brick. Changes from one shape to another can be made in less than an hour's time.

First-Class Workmanship. Cut Gearing. Fully Warranted.

The BERG makes the best sand-lime brick and cheapest because it is the strongest machine and gives the highest pressure. Thirty-five sand-lime plants in United States use the **BERG** Brick Press SUCCESSFULLY.

The BERG MAKES the highest grade of fire brick. Can make all kinds of shapes desired for fire-brick purposes.

Three distinct pressures make the brick evenly pressed all through. No granulated centers of the brick.

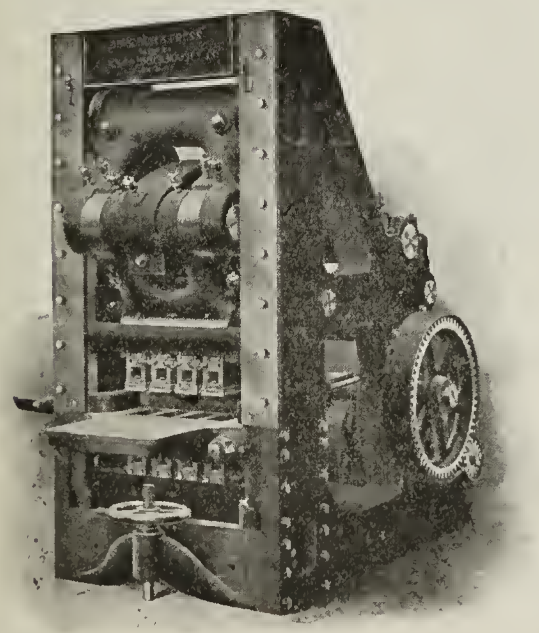
The BERG is the best for sand and cement because of its strong pressure. Uses less cement, makes cheaper brick.

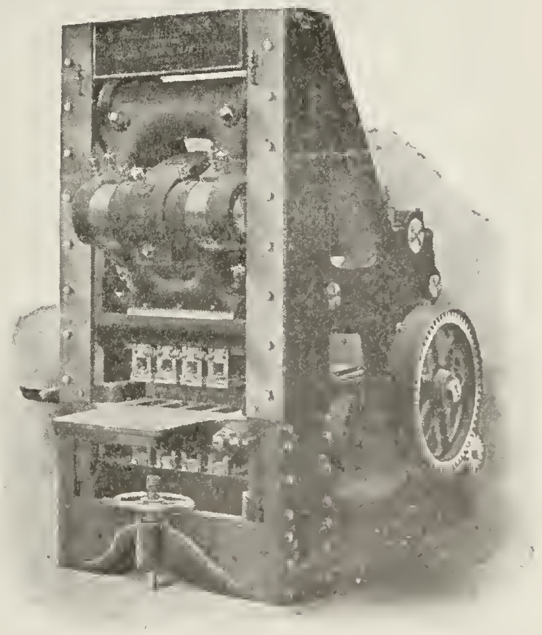
The 1905 Berg Press

Many other steps further forward in improvement and highest grade of material and workmanship, also cut gearing. Fully guaranteed as to its success. Manufactured by its inventor in Toronto, Canada, at the Bertram Engine Works Co. Plans and specifications on the different kinds of plants furnished, also all equipments.

For prices and full particulars, address

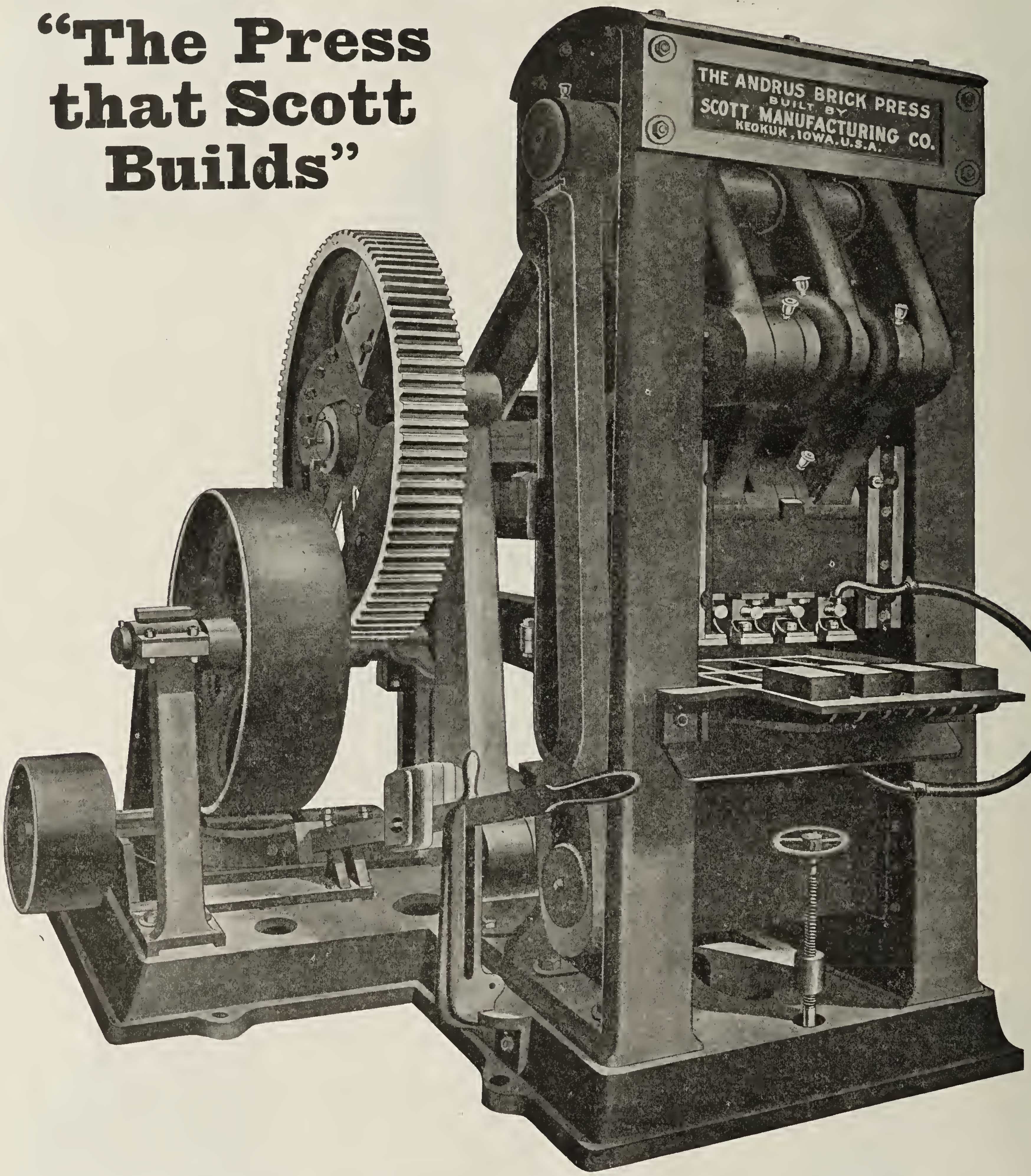
A. BERG
THE BERTRAM ENGINE WORKS
Toronto, Ontario, Canada





One Glance Ought to Convince You

"The Press that Scott Builds"



"Makes Brick every day" because it never takes time to lay up for repairs.

SCOTT MANUFACTURING COMPANY

Works: Keokuk, Iowa. **ST. LOUIS, MO.**

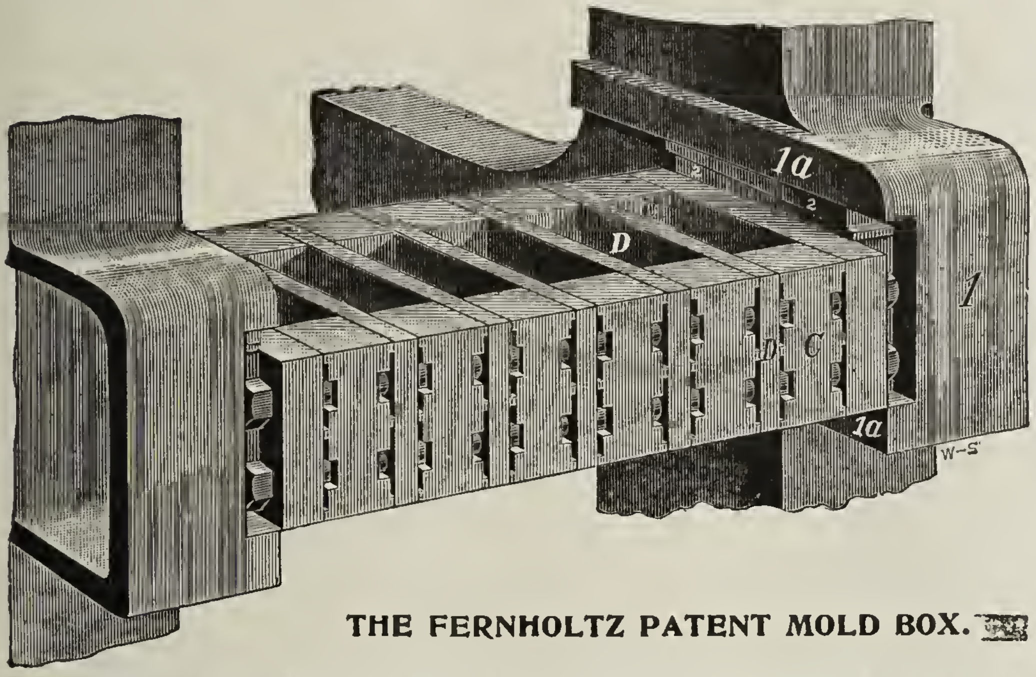
Call and see us in our new office, 609-610 Commonwealth Trust Building.

The Fernholtz Brick Machinery Co.

Manufacturers of

The Celebrated Fernholtz Dry Press

Four mold Press 20,000 daily capacity. Six mold Press 30,000 daily capacity

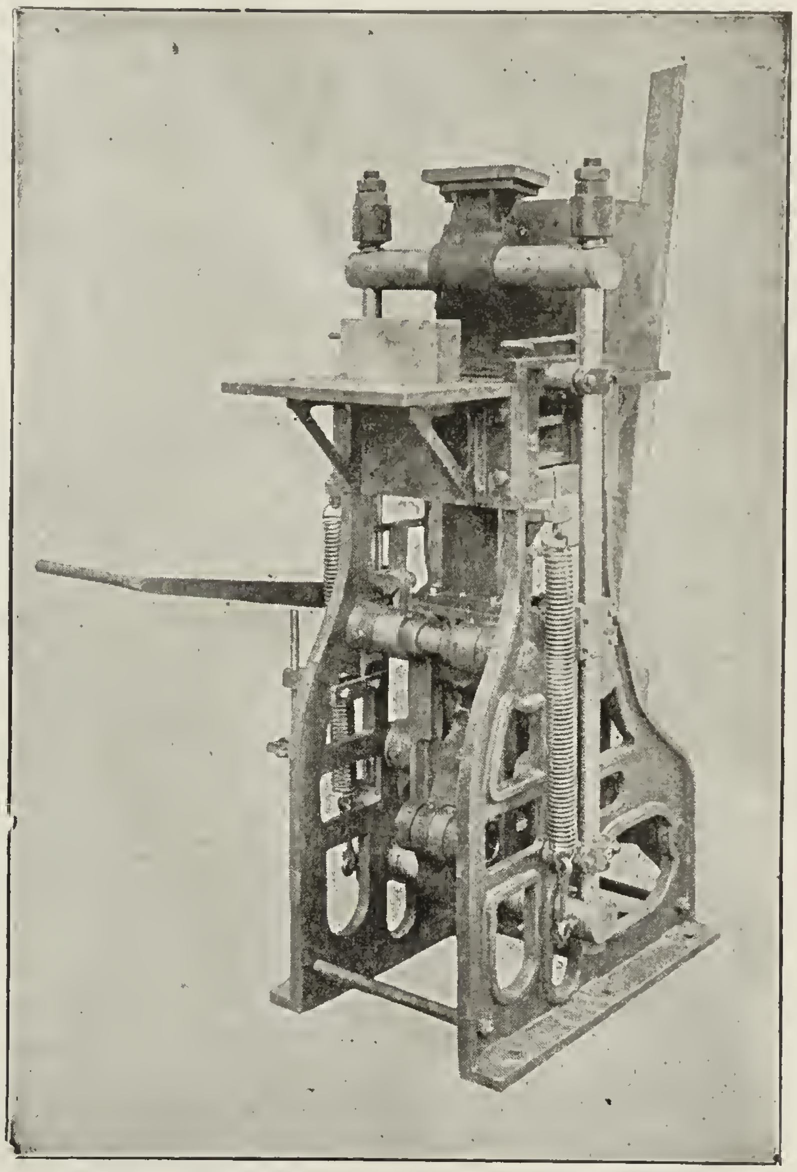


THE FERNHOLTZ PATENT MOLD BOX.

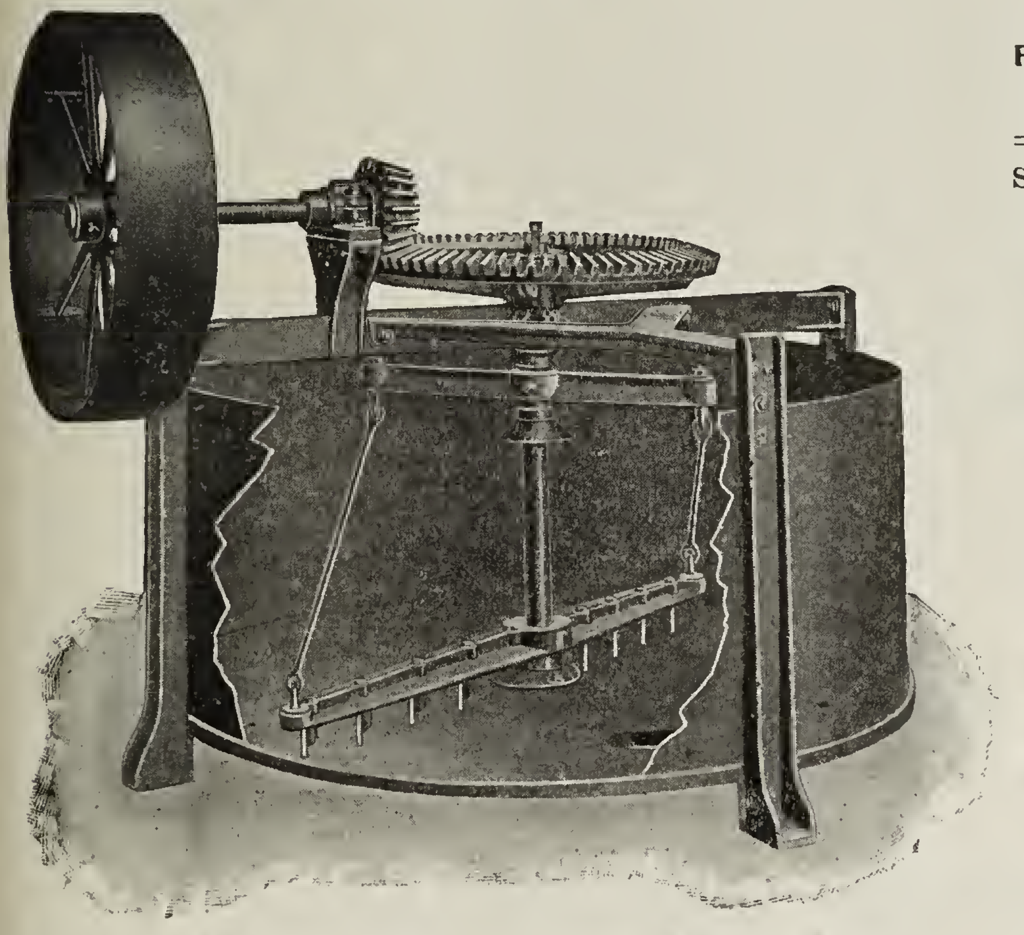
No old style Liners. The Blocks are adjustable and molds are always one size. We have put them in most all makes of Dry Press machines. Easily and quickly adjusted. They are made entirely out of chilled iron, the hardest known metal.

GRATH PATENT HAND POWER PRESS.

Especially adapted for ornamental designs. Any size brick up to 12⅝ inches long, 10 inches wide and 4¼ inches thick.
Brick set into kiln direct from press.



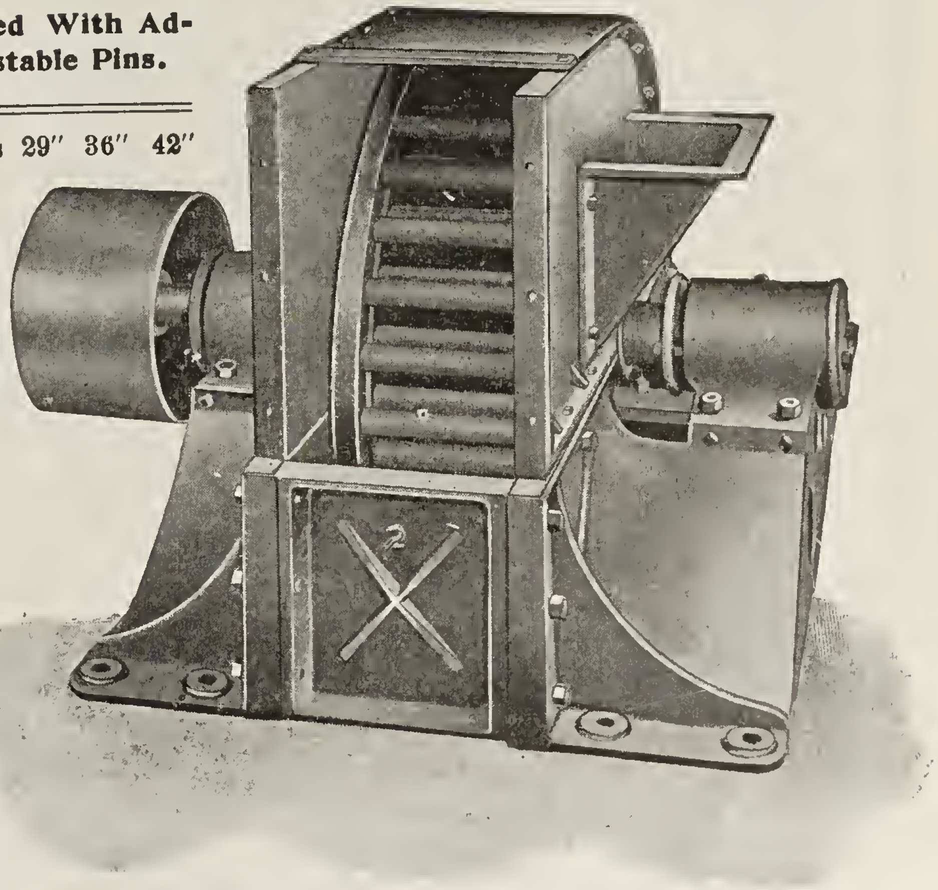
GRATH PATENT HAND POWER PRESS.



A GOOD MIXER IS ALWAYS APPRECIATED.

Fitted With Adjustable Pins.

Sizes 29″ 36″ 42″



THE FERNHOLTZ CLAY PULVERIZER.

The Fernholtz Brick Machinery Co.

Cable Address "Fernbrick." Western Union Code.

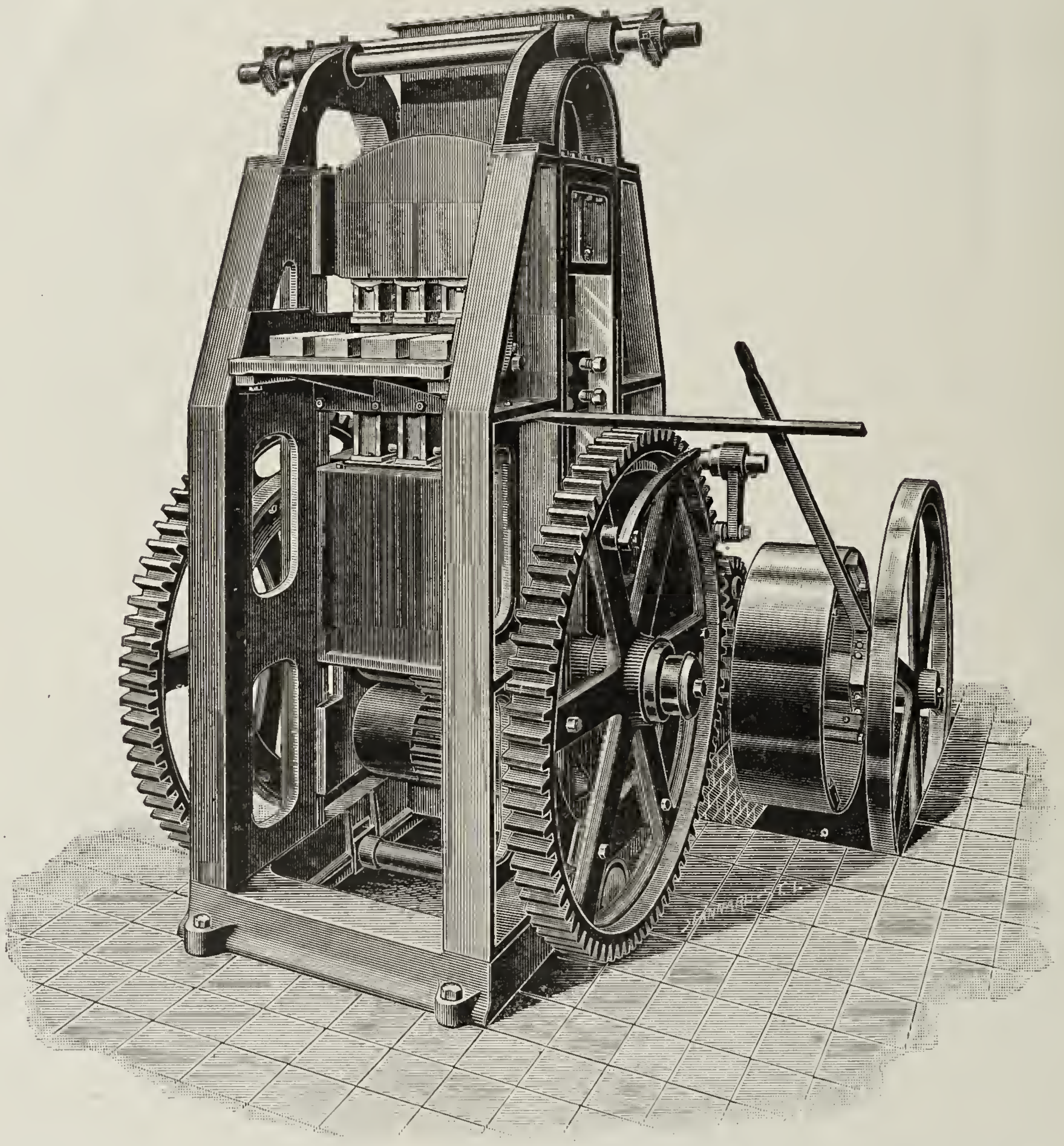
Boyle Avenue and Old Manchester Road, ST. LOUIS, MO., U. S. A.

PERFECTION REALIZED

IN THE

RELIANCE DRY PRESS BRICK MACHINE

(PATENTED)



Main
Features:
Strength
Durability
Simplicity
Saves Fuel
and
Costs Less

No
Toggles
No
Links
No
Pins
to
Wear

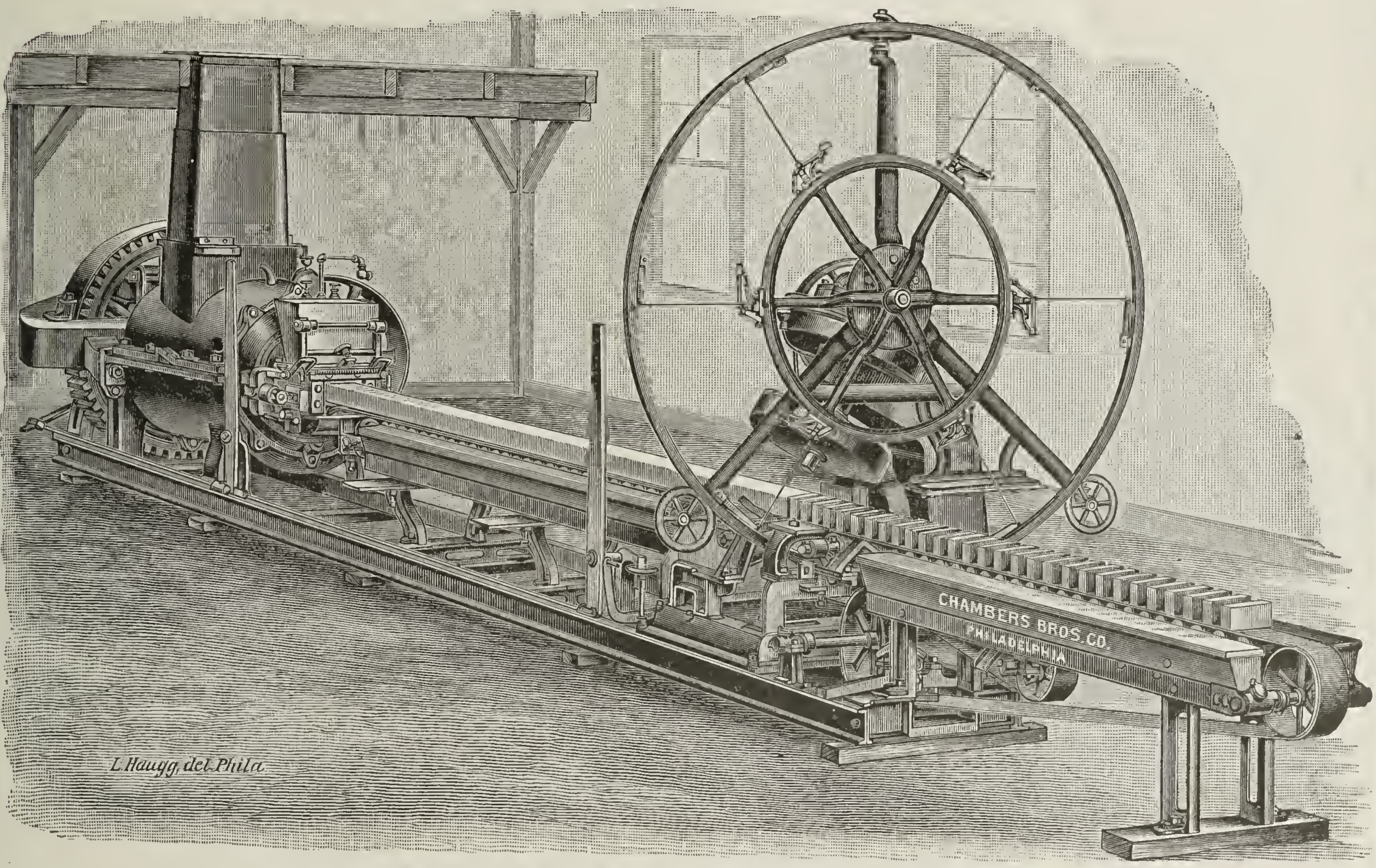
STRONGEST AND MOST POWERFUL BRICK PRESS ON THE MARKET

FOR PRICES AND FURTHER PARTICULARS ADDRESS THE

RELIANCE MACHINE AND TOOL WORKS
ST. LOUIS, MO.

MACHINERY FOR BUILDING BRICK
AND FOR STREET PAVERS

ROUND CORNER PAVING BRICK WITHOUT REPRESSING


CHAMBERS BROS. CO.
PHILADELPHIA
L. Haugg, del. Phila.

THE CHAMBERS AUTOMATIC SIDE-CUT BRICK MACHINE.

Automatic End Cut Brick Machines of five sizes, having capacity from 10,000 to over 100,000 brick daily under favorable conditions.

CHAMBERS BROTHERS COMPANY

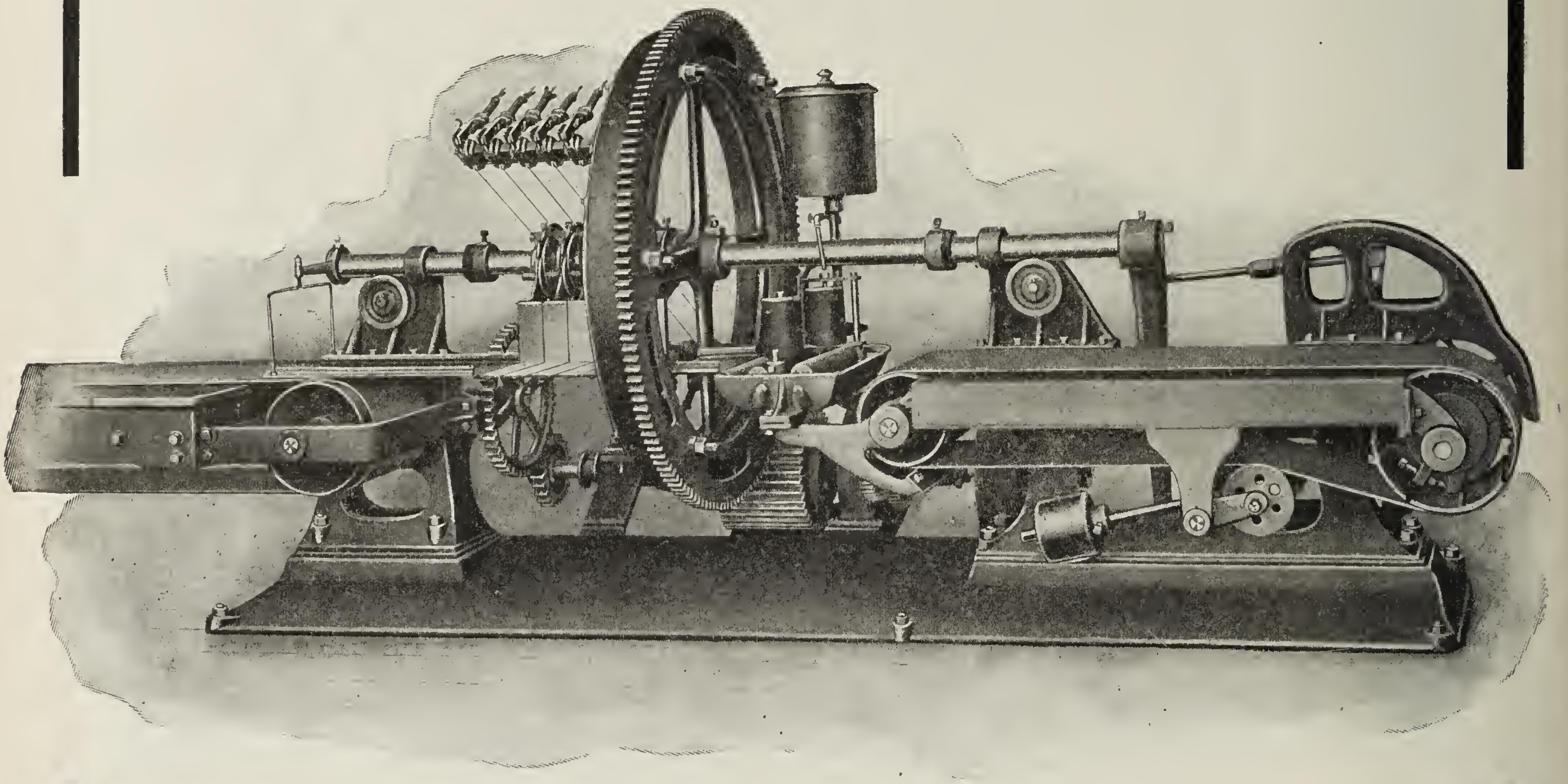
52D AND MEDIA STREETS
PHILADELPHIA, PA.

E. R. FRAZIER, Chicago Agent,
59 West Jackson Boulevard.

REVOLUTION IN

Automatic Cutters

Simple, Accurate, Light Running, Continuous Motion,
Perfect Brick.



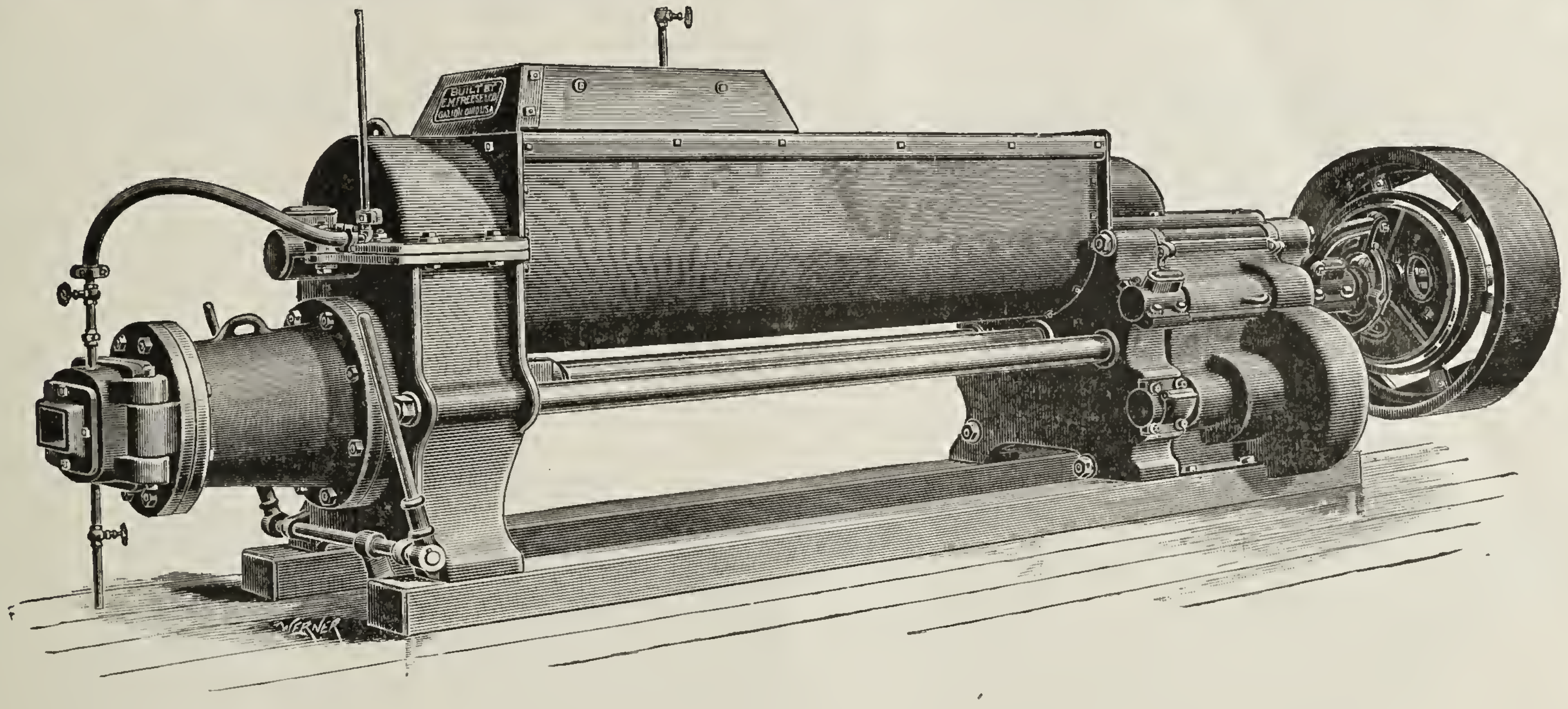
No. 25 Automatic Side Cut Brick Cutter.

THERE has never been introduced to the trade such a combination of excellent features, simplicity, accuracy and durability, as those embodied in our No. 25 Cutter. This cutter is beyond doubt the biggest value in cutters on the market today. Send for complete description. Our new catalogue is ready for distribution. If you haven't a copy send for one. It gives full information regarding our complete line of Dry Press, Stiff Mud and Soft Mud Brick Machinery, Roofing Tile Machinery, Sewer Pipe Machinery, Sand Lime Brick Machinery, Cement Machinery, Waste Heat, Steam and Hot Air Dryers and every appliance used in the clay trade.

The American Clay Machinery Co.

BUCYRUS, OHIO, U. S. A.

UNION BRICK MACHINES



We build these Machines in five sizes. Capacities to 10,000 brick per hour.

Several hundred are in everyday use. They do first-class work and are convenient, economical and durable. This can be verified by investigation.

We also build Brick Machines with separate Pug Mill.

Don't forget our Automatic Cutters. **They give satisfaction.**

State your requirements and let us furnish particulars.

E. M. FREESE & CO.

GALION - - - - OHIO

LAMINATION is the source of more loss, more worry and more anxiety than all other troubles of a brickmaker

KENTON C READ, Pres. ANDY O'CONNELL, Vice Pres. and Gen'l Mgr C. M. MILLER, Sec.-Treas.

THE

C. M. Miller Mfg. and Mining Co. Inc.

MAKERS OF

High Grade Veneer and Building Brick

Office, 331 Ohio Street.

New Phone 1142.

Terre Haute, Ind. Dec. 22, *190*4.

Mr. H. L Hix, Mgr

The Wallace Mfg Co, Frankfort, Ind.:

Dear Sir—I feel that I must tell you my experience with the brick made on the Intermediate Wonder:—

A few days ago a very prominent contractor asked me to bring him some samples of our brick. I fixed up some samples and started to his place, and just as soon as he saw them, he said: "I don't want them—they are no good; I would not lay one of that kind of brick," but I begged him to look at them and tell me why he did not want them. He asked me if he could break one of them, and I said, "Yes, break all of them." So he took his hammer and hit one on the corner; then he looked up at me and said: "I never saw a stiff mud brick like that;" then he broke it all up, just as nice as any brick, and he said: "That is the first stiff mud brick I ever saw without lamination," and that they were all right.

We are now selling our brick as fast as we can deliver them.

Pardon me for taking your time, and with SUCCESS to the WONDER, I am,

Yours very truly,

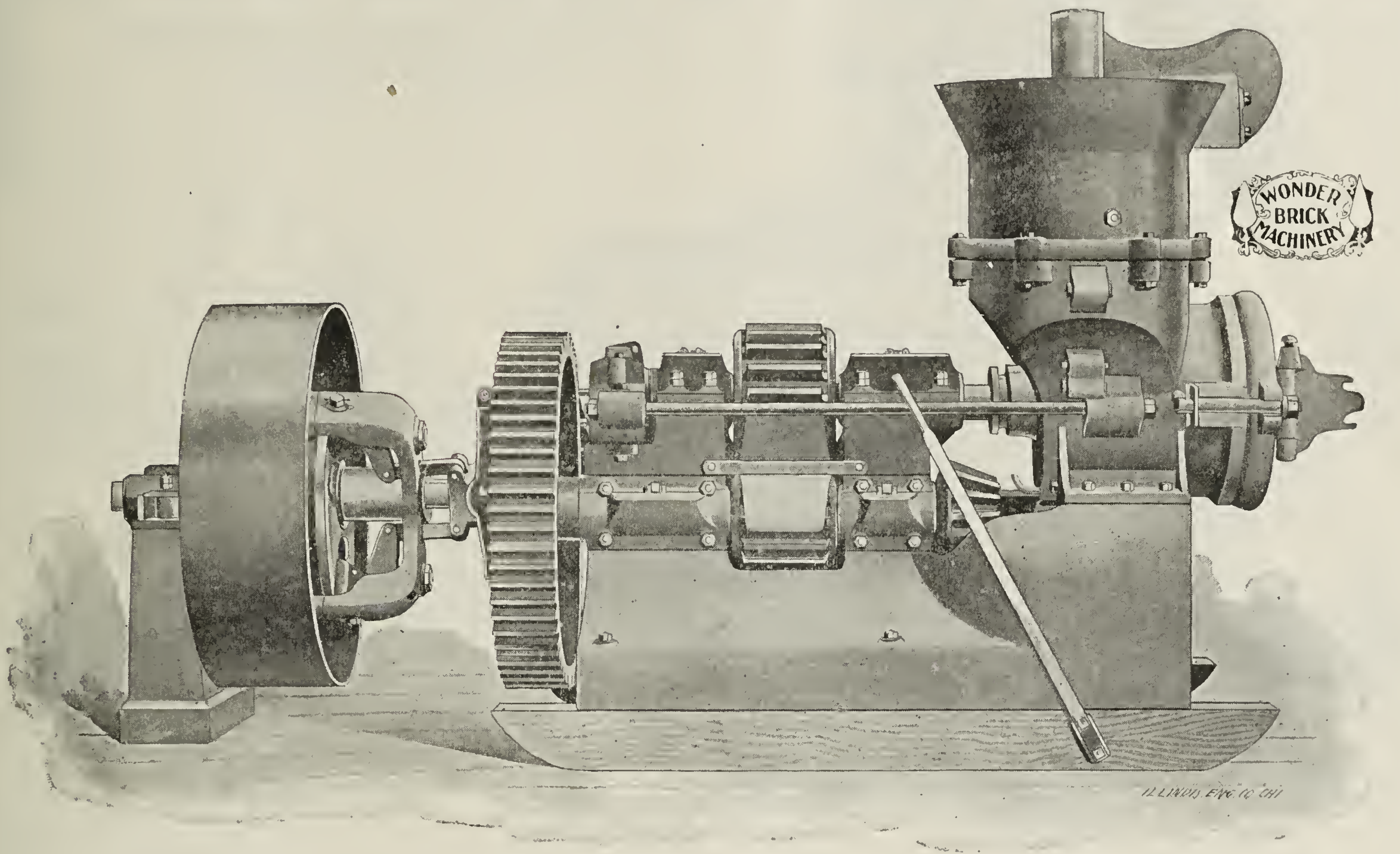
Andy O'Connell
V P and Gen Mgr

In the event that you want to make brick filled with LAMINATION, CRACKS and CROOKS, a Wonder Machine will not answer your purpose.

THE WALLACE MFG. CO.

FRANKFORT, IND., U. S. A.

PRAISED BY EVERY USER



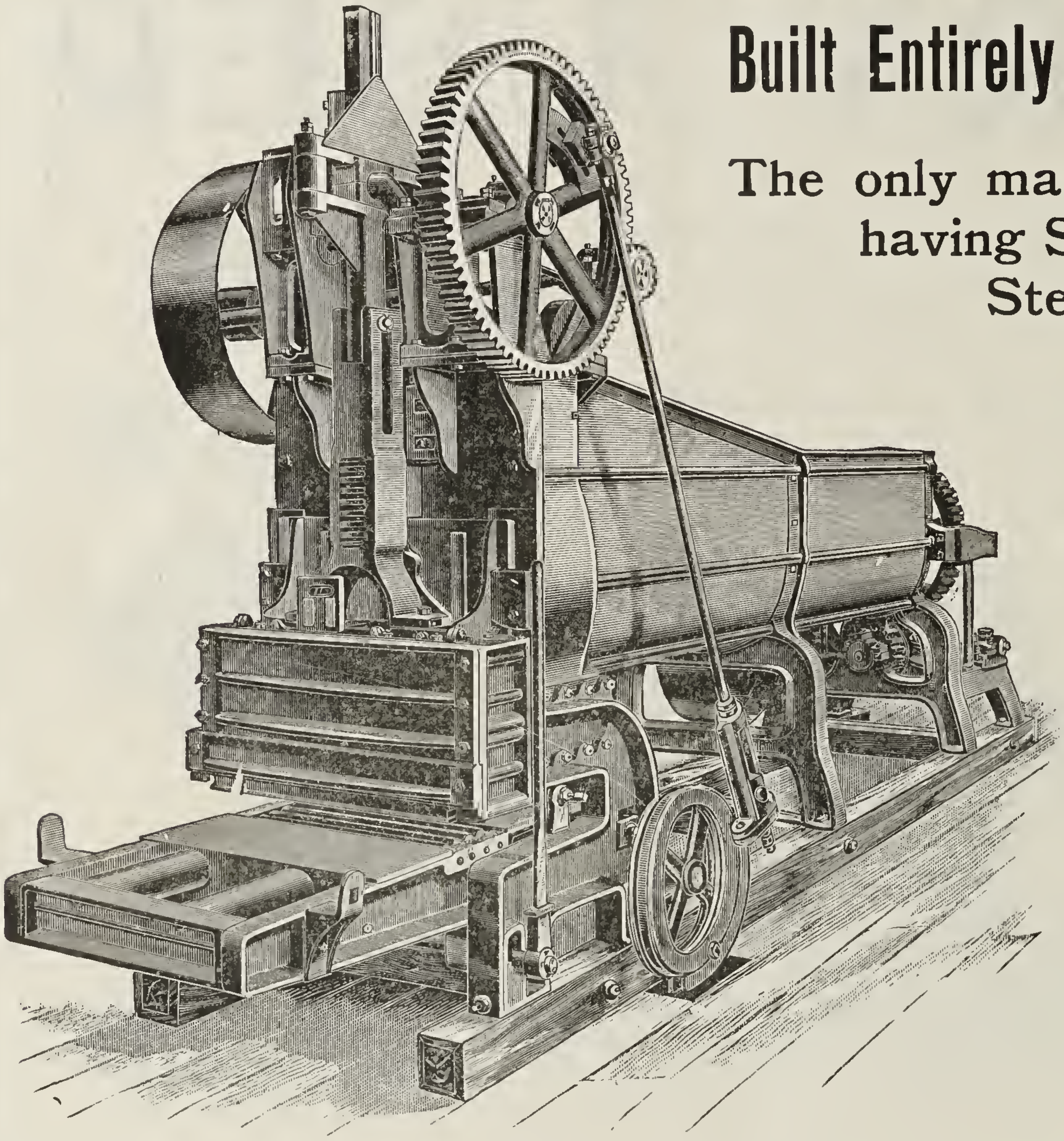
INTERMEDIATE WONDER.

40,000 daily capacity. Meets the requirements of the brickmakers.

The Wallace Mfg. Co.

FRANKFORT, IND., U. S. A.

THE POTTS
HORIZONTAL BRICK MACHINE



Built Entirely of Iron and Steel.

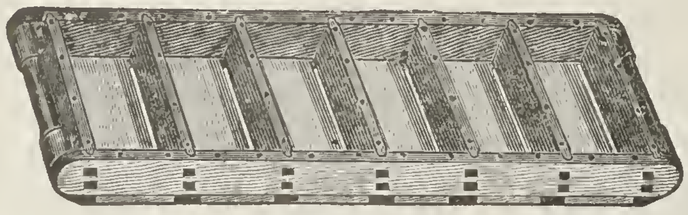
The only machine of this class having Steel Gear and Steel Shaft.

Built of the Best Material by the Best Workmen.

Simple, Strong and Durable.

No extra pug mill required to enable working the clay direct from the bank. Its great strength enables working the clay as stiff as practicable, insuring brick which will be STRAIGHT and SQUARE.

THE LEADER OF ALL SAND MOULD MACHINES.



BRICK MOULDS A SPECIALTY

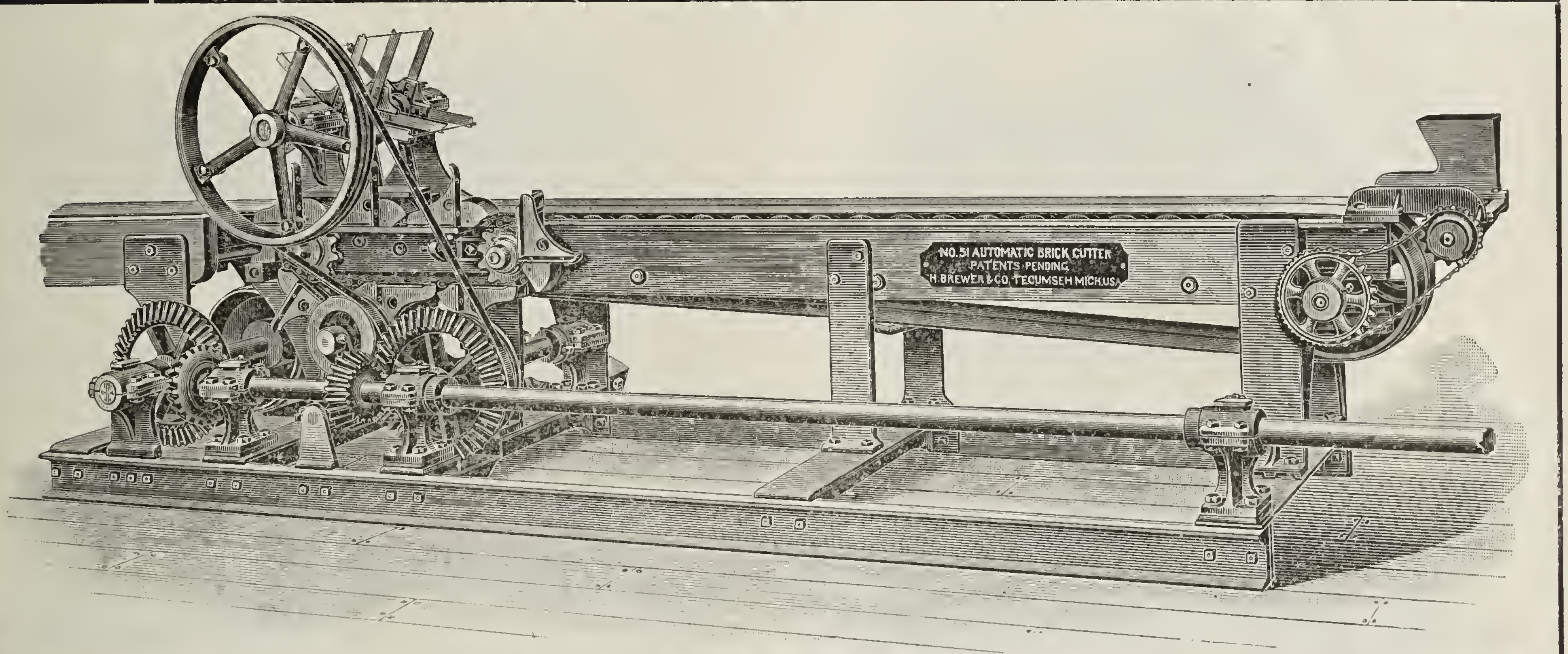
QUALITY IS OUR AIM.

We manufacture a complete line of Brick Yard Supplies. Write for prices.

C. & A. POTTS & CO., Indianapolis, Ind.

A NEW ONE

The New Brewer No. 51 Automatic Cutter for end-cut brick is now ready, having passed through all the practical tests which are necessary to develop a good machine. It cuts either single or double column ware, the former on edge or flat. It has an efficient sander, a perfect measuring device, and will cut as many or as few brick as the machine in front of which it is placed will make.


NO. 51 AUTOMATIC BRICK CUTTER
PATENTS PENDING
H. BREWER & CO. TECUMSEH MICH. U.S.A.

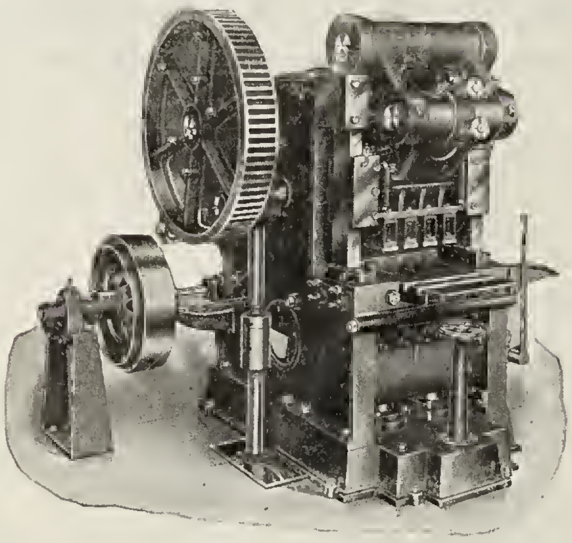
If interested in Automatic Cutters for side cut or end-cut brick, drain tile or hollow blocks; if you want to investigate crushers, disintegrators or pug mills; if you would like to know about a line of combined brick and tile machines, including both large and small ones; or if you have anything special in the line of clay-working machinery which you would like to have put in practical shape, write

H. BREWER & CO., TECUMSEH, MICHIGAN.

Built Right Run Right

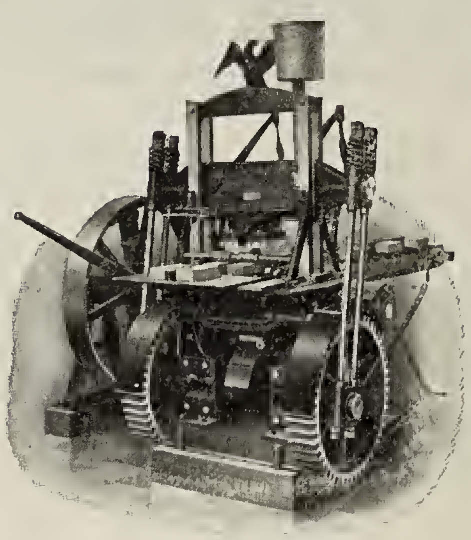
The American Clay Machinery

These are a few of the many Superior machines we manufacture for the Clay Trade. Large cuts



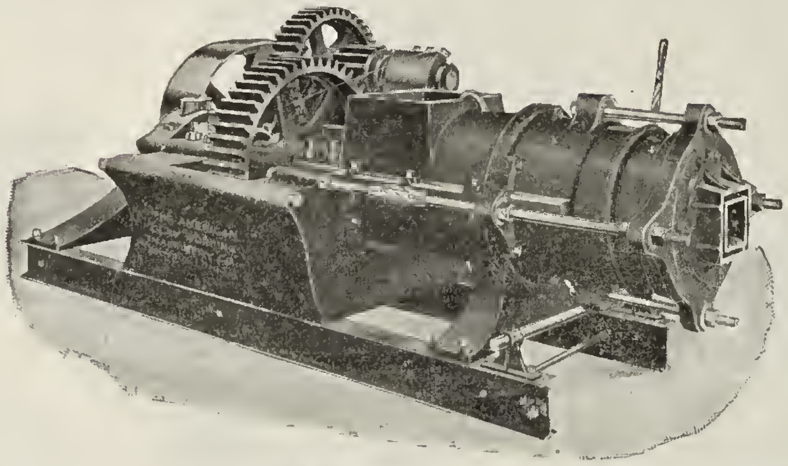
DRY PRESS BRICK MACHINERY.

We build a full line of Dry Press brick machinery. We have four styles; and eight sizes, ranging in capacity from 1,000 to 3,000 brick per hour. This cut is our four mold, Moldel B press, especially adapted to Sand-Lime brick. Write for complete catalogue.

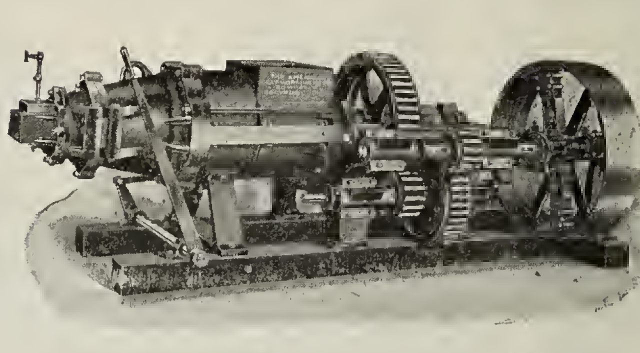


REPRESSES.

We build a large and complete line of represses in six sizes and styles. Capacity runs from 600 to 2 500 brick per hour. Send for our complete catalogue. This cut is of our double mold Eagle Repress.

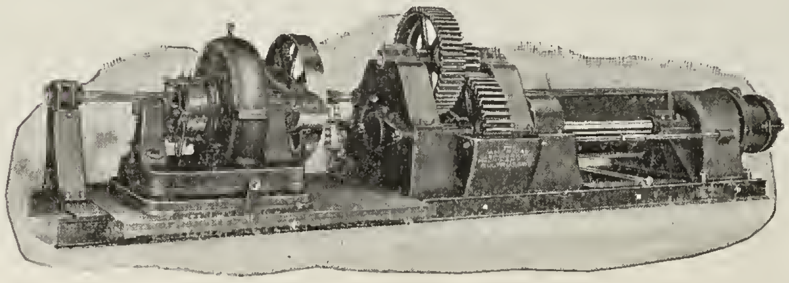


No. 40 AUGUR MACHINE FOR HOLLOW WARE.



No. 2 GIANT AUGER BRICK MACHINE.

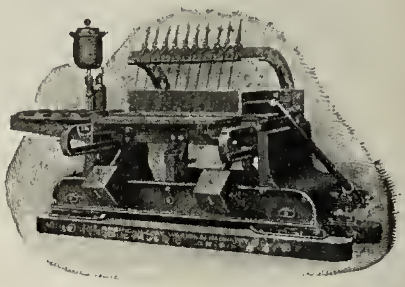
We build ten sizes and styles of Auger Machines. Capacities 1,500 to 10,000 brick per hour. Write for complete list.

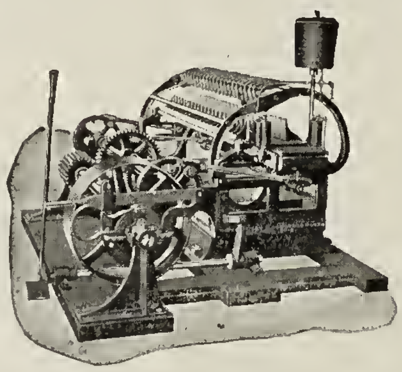


No. 23 ELECTRICAL DRIVEN, LOW FRAME, COMBINED MACHINE.

We make a full line of electrical driven clay-working machinery. Send for catalogue.

SEMI-AUTOMATIC AND HAND POWER CUTTERS





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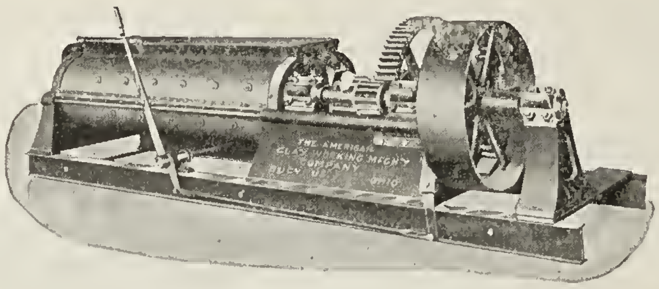

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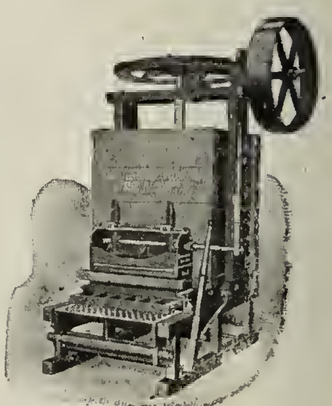

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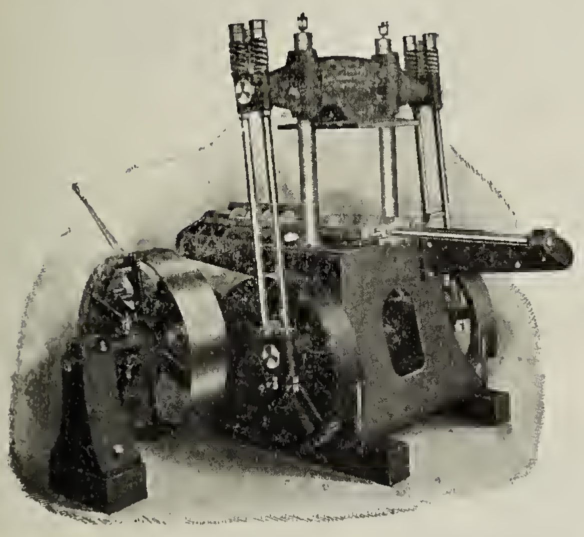

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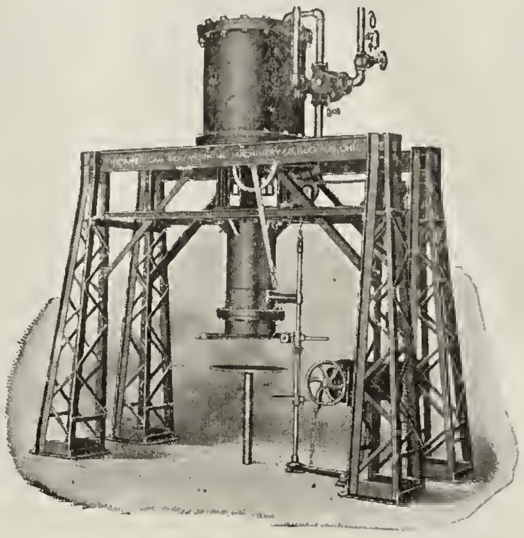

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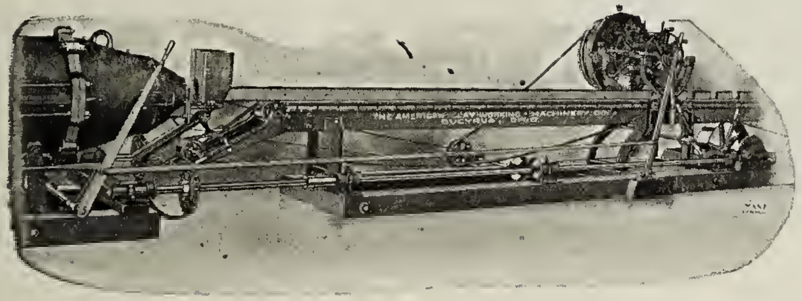

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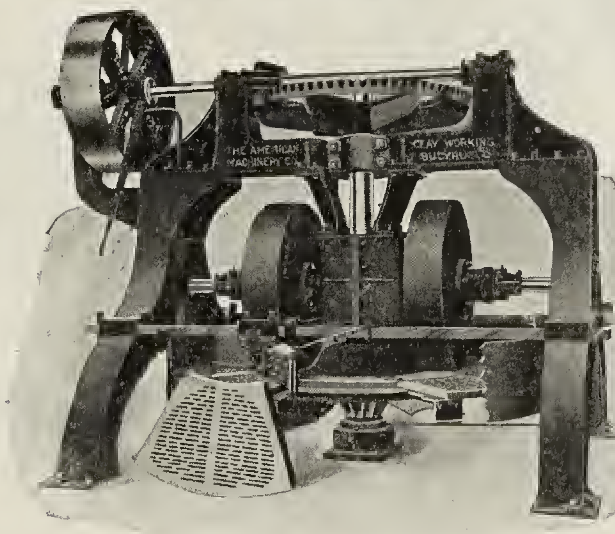

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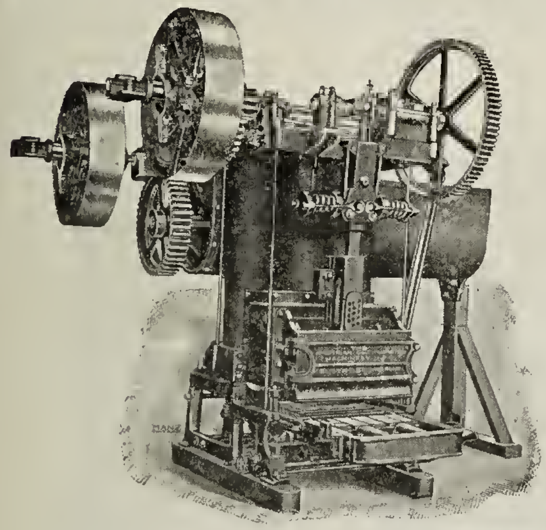

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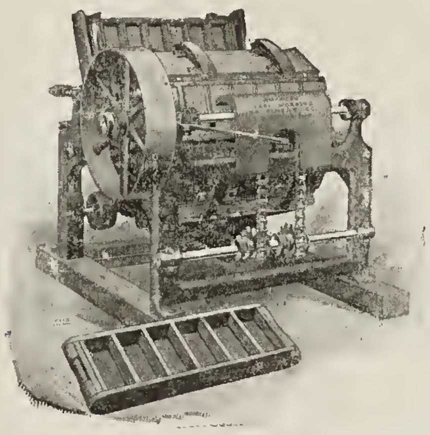

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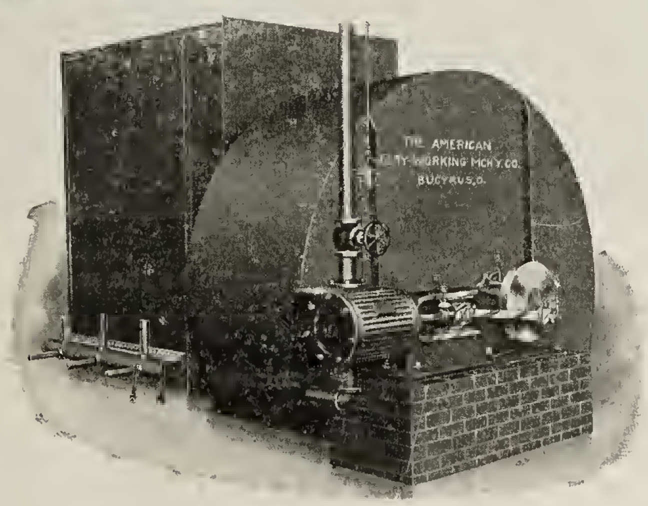

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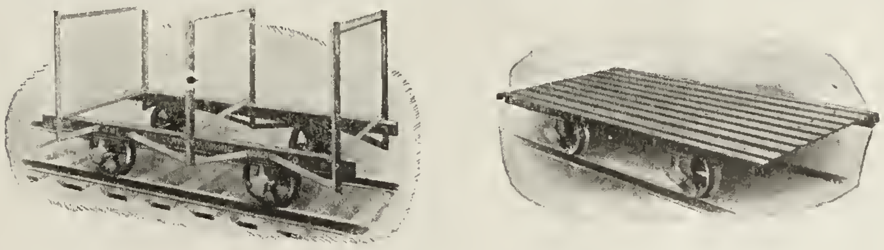

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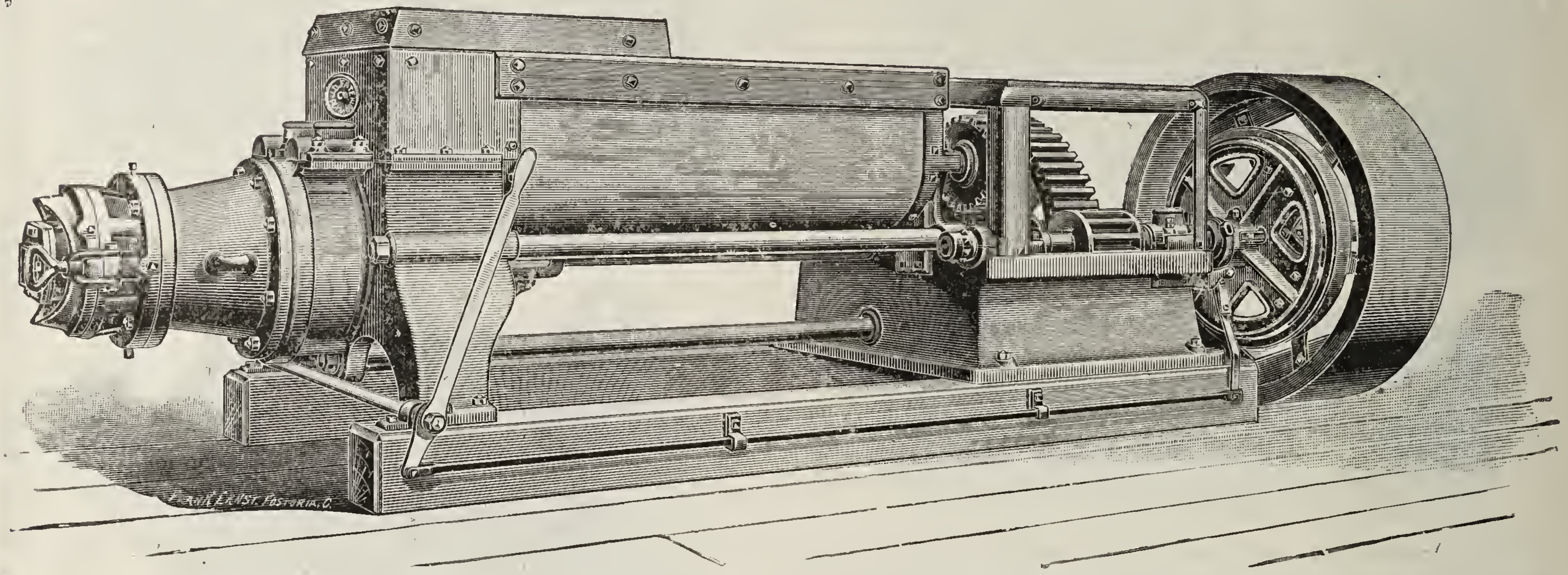

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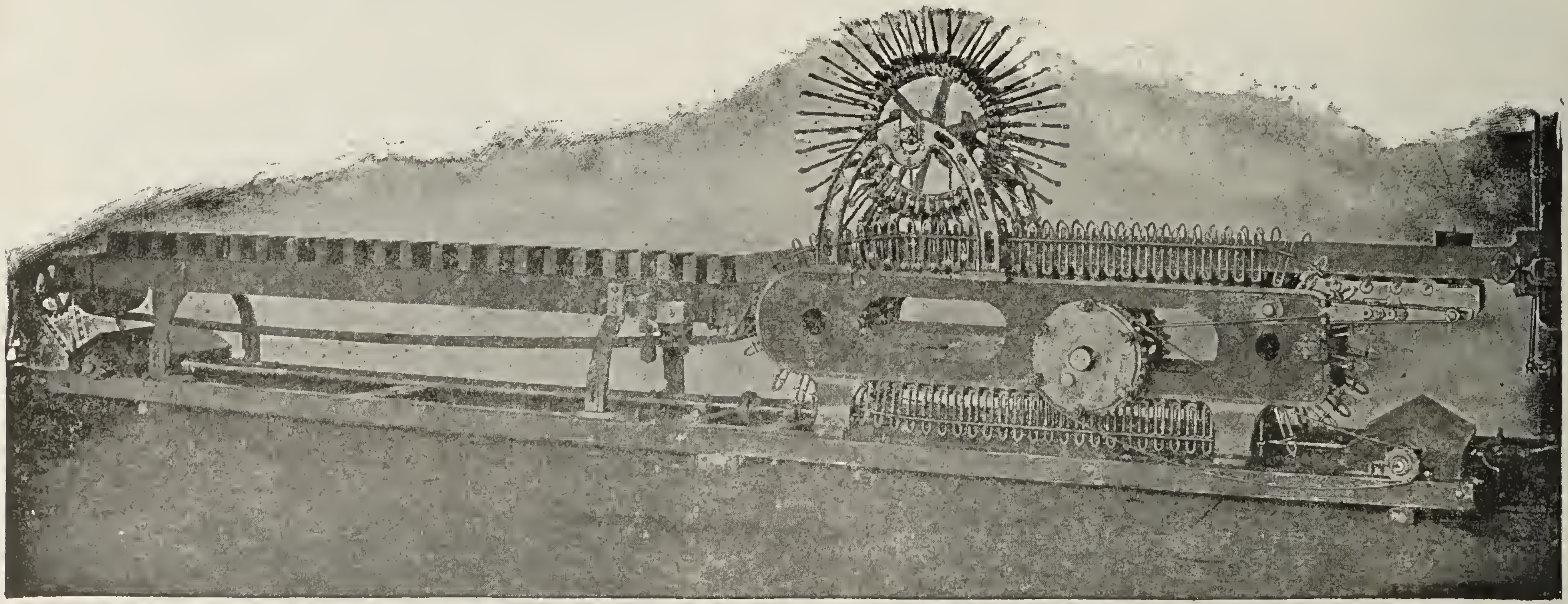

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CLAY RECORD

Vol. XXVI. No. 5. CHICAGO, MARCH 15, 1905. Semi-Monthly, $1.00 per Year
Single Copies, - 10 Cents

A DISCUSSION ON THE QUESTION OF BURNING BRICK AND HOW TO LOWER ITS COST.*

B. E. Bechtel of Waterloo, started the discussion by saying: This is certainly an important question, and I don't like to start the discussion on it. As you know, it is an open question whether it is cheaper and more satisfactory to burn brick by the up-draft system or by the down-draft system, or with the use of continuous kilns. There are a great many systems of burning brick. Four occur to me at the present time: the up-draft or Dutch clamp system; the down-draft, the continuous system, and what is now known as the railroad system. Of course, according to all the information we have at present, the most satisfactory and cheapest system of burning brick is the continuous kiln; that is something that is not probably practicable to ordinary brickmakers, particularly in Canada. We have not, most of us, $25,000 or $30,000 to use to build a kiln with; and a continuous kiln requires money to build. Of course the question of burning then resolves itself for the ordinary brickmaker, I think, to the question as to whether the up-draft or down-draft kiln is most satisfactory. Both systems of course have their defects, and both systems are certainly very satisfactory. In fact, they have been used by brickmakers—particularly the up-draft system—almost from time immemorial, and it certainly is a good system. When they change to the down-draft system, those who do, claim it is an advantage. I should like you to take this subject up and discuss the question as to which of the two is the most satisfactory.

There is another question, as to whether we should use wood or coal. There is not much doubt about which should be used. Wood is a scarce article. We cannot buy wood at all in many sections of the country, but this is a matter of only recent date. It is only a very few years since we could all get all the wood we required. We can't get it now.

Now the best method of burning is the question that somebody might enlighten us upon. Those of you that were down at our yard this morning saw that we were using the sloping grate with the pocket in the rear of the grate. This pocket is there for the purpose of holding the partially burned coal; and the fresh coal is just thrown in the front of the door and as the coal burns it slides down and drops into the pocket. The gases from the coal that has just been put onto the fire pass over the hotter zone and in this way the gases become thoroughly burned. We believe this is a good thing. We believe that for the purpose the sloping grate is the proper thing. Of course some of you may have used some other kind of a grate and may have found it to be particularly satisfactory.

(Mr. Bechtel here gave a description of the Boss system of burning.)

A discussion of grates and grateless fireplaces then took place, the chief point of interest hinging on the right size of grates for certain kilns.

Mr. McCredie.—I have started to burn coal this summer, and I am very anxious to learn the best means of burning with coal.

I feel that I know so little about brick burning that I don't stand up here to give any advice to any member of this convention, but I will simply tell you how I have operated. I live in a part of the country where we are not wholly void of wood yet, and I am still burning wood with my coal. I burn wood till the kiln is thoroughly dry exclusively, then I begin burning with coal, and I continue the wood for perhaps from 36 to 48 hours, and finish up the last 24 hours perhaps with coal. I have found this to work very satisfactorily. I find I can make a very high fire with coal and wood combined. From your point of view I have not got my grates at all right, sir. In one of my kilns I have a three-foot grate in the end, just coming inside of the inside wall of my kiln, leaving a space of some 14 to 18 in. of a pocket, half circular, beyond the end of the grate, with an ash-pan the whole length of my grate. In my other kiln I am using a four-foot grate and I have the inside end of that grate placed clear to the inside of the pocket. My object was to get it so that the heat going up from the grate would go straight up or as nearly straight up as possible. This is the way I have been operating my kilns this summer. If there is something better I am very anxious to know. I have found it to work very satisfactory. I am satisfied by using coal and wood together you can get a burn that is very much cheaper than burning with wood alone. I am satisfied that in using it that way coal at $3.50 a ton is cheaper than wood at $1.50 or $1.25 a cord—soft wood.

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*Discussion at the recent Ontario Clayworkers' Association meeting, held at Waterloo, Ont.

Mr. S. J. Fox Lindsay, M. P. P.—You can get one kind of clay to burn in the up-draft better than in the down-draft, and for that reason we have to adapt our system of burning to suit the clay in which we are working. In my case we have the two kinds, red and white. We can burn the red without any trouble in a down-draft kiln, but they wouldn't be set according to the way Mr. Cornell says; we don't want three holes outside, and we can get far better results by blocking them in and leaving an inch and a half between the ends from top to bottom of the kiln and putting in a tie here and there to keep them from settling; but in our white if we blocked them in in the same manner it would take us 9 or 11 days to get the fire to go through them to burn. There is nothing in it to burn out, therefore it takes that much longer to burn the material. In the white clay I have been using coal dust mixed in the brick and I find that has helped us a good deal. In the red we have enough burning matter and at times too much.

Mr. Hilliard.—Do you mix that dust in the manufacture of the brick?

Mr. Fox.—Yes; screen it. Mix the dust of the hard and soft coal in your heap. I found that made a good deal of difference in the burning of the white. If you don't have enough in you don't get the result. You want to have about a bushel to a thousand. I have built three on three in a down-draft kiln and we never could get the fire to the bottom; the top brick would be hard, the brick half way down would be a good face brick and the bottom brick soft, but when we left the draft off until we got the steam all off and the fire to the bottom we found that we had far better results. I think while it might suit in one place it won't suit in another. Of course there are different classes of kilns; we don't all have the same kind of down-draft kiln; we may not all have the same amount of draft in the kiln. One man's kiln might have twice the amount of draft in the smokestack and it would take the fire in more to the bottom. I don't know that I need refer to the different classes of kilns. We have not many kilns in this country now that are continuous; there are a few. But you have the continuous kiln, the up-draft kiln and the down-draft kiln. There are different types of kilns which are in use for the burning of brick. I believe myself that the continuous kiln is the best, as far as saving fuel is concerned. Whether you can get as good results I think depends more on the man that is burning. You can take a first-class clay and put a poor burner at it and he will spoil the brick, anyway. But if you have a good burner, who understands the kiln and knows how you handle it, the result will be different.

The brickmakers, as a rule, have not been counted away up among the professional class, but we today in the Province of Ontario should feel proud of the position in which we stand in regard to the building material of the present and the future. Some talk about cement. I don't think that cement for what we call building purposes above ground is going to take the place of brick, as some think. The promoters of cement companies put out some very nice pamphlets and give nice figures. Take the cement factory of the National Cement Co., at Durham. They were telling how they got the contract for the dairy building in Toronto at the Exhibition Grounds; that they underbid all their competitors. Cement took the lead. Gentlemen, I say that that was deceiving the people of the Province of Ontario to this extent; they took that contract far below any other figures which were offered for it and they lost close onto $7,000 in that contract. I don't think the brickmakers of this country have anything to fear along those lines.

I just wish to say when I was in Toronto to-day I went up to the Parliament Buildings and I got from the Bureau of Industries a report of the Bureau of Mines, and I found that the clay products—pressed brick, common brick and drain tile—gave a value for last year of over $2,000,000. There is no other product on the list of what we call non-metallic products which comes up even to common brick in value of output. So that you can see the position in which the brick trade is in the Providence of Ontario. It heads the list of non-metallic products, and I think we should feel proud of that.

On the question of burning we must consider our change for just one-half what we have to pay for it to-day. A pound of wood, it don't matter whether you consider beech or maple, the weight for weight will give you about the same heat in units. Hickory stands at the head of the list:

	Weight.		Weight.
Hickory, shell bark,	4,470 lb.	Beech	3,125 lb.
Hickory, red heart,	3,700 lb.	Hard maple	3,975 lb.
White oak	3,850 lb.	Virginia pine	2,680 lb.
Red oak	3,250 lb.	Yellow pine	1,904 lb.
Spruce	2,325 lb.	White pine	1,860 lb.

Now it doesn't matter what kind of wood you take, if you take the weight, they give you about the same heat per pound of wood. And when you compare one with the other you could take those figures and make a basis of what the value of each cord of wood would be worth to you. You must also take into consideration whether it is sound or half rotten. A great deal of the brick wood is half rotten.

Now there is another thing that is probably of interest to us. I was reading in the returns for peat in other countries coming up on the train, that in Holland they use peat for burning brick. Here is a clipping I cut out of the Mail on December 2nd. It says here: "An admirable bulletin on the great resources of Canada, by Dr. Chalmers, of the Geological Survey, was issued to-day. It gives the total known peat areas of the Dominion at 37,000 square miles, but Dr. Chalmers considers that future explorations will show a much greater area. The bulletin describes the different manufacturing processes which are being used in the Dominion, and the best known deposits."

Now I might say that down in our home section, near Beaverton, there has been for this last three or four years a Mr. Dobson, who has been manufacturing peat and selling it for $3 a ton. My own opinion is this: that if there could be a fireplace made so that you could burn it without much manufacturing—gathering it in dry weather—we might be able to do part of our burning by common peat such as the steaming process of brick. In most sections of the country you can get the bogs and if peat could be used instead of coal it would mean that even a brickmaker would manufacture his own fuel, even if he made it into bricklets the same as Mr. Dobson is making them. I was thinking myself it might be a good thing for the brickmakers when we assembled to adopt a resolution to ask the government, either Dominion or Provincial, to look into the matter and see how it is handled in other countries for the burning of brick. I think the government might be quite a bit of assistance to us. We had another company down there, known as the Trent Valley Canal Peat Co., of Craigsville. There were American and Toronto capitalists in it, and they spent $60,000 to $80,000 and the whole plant has been torn down and taken away. My opinion is that the government should do some of the experimenting for the benefit of the clayworkers of the Province of Ontario. On the other side the National Brick Makers' Association, after they had formed their organization, got the government interested in the clayworking industry to a certain extent, and they went on experimenting. They have a school at Columbus for that purpose and I think they have done a great deal of good both for the producer and consumer of the clay product.

Now I do not know that I wish to say much more upon this subject, but I say this: take the up-draft kiln and you can set brick 3 on 3 and block them as you like. If you block them you can not block them right to the top because the fire would go down too easy on you. The way I have been burning this last two years is this: We have our brick laid to give six bricks to the arch. In between the two center bricks we skintle till we get up to the jet, then we turn around and block them crossways, leaving them an inch and a quarter till above the arch on the third row; then we turn around and block them across the other way until we get within six rows of the top; then we set 3 on 3. I tried one or two kilns lengthwise before and I didn't like it in the white; in the red is seemed to do better work. But the flat row you lay on top; we used to put them all on stretchers one way and leave them on loose about quarter inch between and just as soon as our steam would come off we would get up on top and start to fire up. You all know what kind of job it is. But my cousin from Toronto was down and he said he had been putting on the platting four in length and then made a stretcher across the kiln and he put them all as tight as he could get them. Before he lit the kiln he would go on and lift up a brick every fourth or sixth row across the kiln. When the steam was off in any part of the kiln he would go and drop in a brick there. The brick that came out would go back in again. I found a great deal more satisfaction in doing it that way than the other way. When your steam is all gone you have no draft apparently. Smoke and that would be coming out of the spy hole and out of the arch and working its way up. You could not get the fire to burn fast enough to go up to the top to hurt the brick. Where, when you had the loose platting on, the fire would go up and if it was red brick, probably would shake a lot of them off. In some places probably it would not work that way. I know there is a difference in white brick and in red right in my own clay.

I found it was different when we were setting 3 on 3 with a loose flatting on top and had white brick; the whole of the kiln, in the arches and all our arch brick would all fly and go to pieces if we didn't have enough sand in it, if it was a little close in the grain; but when we had a tight platting on top so that we forced the smoke and fire out of the spy holes we scarcely had a broken end on the brick in the arches. I am satisfied it is an improvement as far as we are concerned there.

Several questions were asked Mr. Fox by Messrs. Hilliard and Janes on the statement already made. Mr. Fox, in his reply stated that instead of covering his up-draft kilns with clay, he used a second flatting packed as tightly as possible after the firing had reached a certain point. He also used a down-draft kiln with six chambers, four of them built for tile and two for brick. The kiln was not a continuous one, each chamber having a separate chimney and all the flues under control by dampers, so that the heat may be directed either to the end flues or to the center as well. To the query as to which gave the most satisfaction, the up-draft or the down-draft kiln, Mr. Fox replied that the down-draft was the best for red brick, but for the white brick, unless coal dust was added to it, the best results were obtained in the up-draft kiln. The down-draft kiln was the most economical in fuel. He preferred the square kiln and did not like the round kilns because, no matter which way the wind was blowing, the wind was always curling around the kiln more or less.

Mr. Moody.—We set our products 16 tiers high; we generally go by gage; we never put our brick in closer than six inches from the crown and over the fire place we have a little more space. We have an 8-in. crown and 12-in. wall; our arches are four and a half feet from the inside of the pot to the outside of the door; width 32 in. We lose 32-in. at the grates on all our kilns. We put our ninth tier right against the crown, the 10th tier we keep back six inches. We burn 16 tiers in our round kiln. We built this kiln especially for coal and we left our arch in case of emergency so that we can burn wood. We have an inch and a quarter dip down at the lower or back end; and this fire hole is about 21 in. across and about 22 in. high; I think the doors are 21x21. We find those arches burn coal equally as well as wood. In heating up those arches sometimes we have to damper up the bottom part of our ash pit to stop the draft from getting in under. I have noticed some fellows telling me they have trouble with a coal fire coming back on them. We are troubled the other way, so that there must be something in the draft. I claim there is more in setting a kiln than in burning it. You choke up a kiln on one side and put it too close to the crown and one part is going to rob the other part. I am very particular in that. I always watch the setting of those and have the fire space between the tiers about an inch and a quarter to inch and a half; and we have them all alike; we have a uniform draft through the kiln.

Mr. Fox.—I find where we have our brick too far away from the side of the crown running down the circle the steam gets off there first and any vegetable matter that is in the brick burns out and it is harder to get the fire back in again. Where they are blocked we calculate to leave them so that a knife blade will go between them; we slide them in and let them go.

Mr. Moody.—We pile ours perfectly solid. Of course it is wire cut brick.

Mr. Fox.—There is a point which is raised in regard to the fire place. Two years ago I was in Chicago and I went down to Galesburg to the Purington paving brick plant. As you all know, they are the largest manufacturers of paving brick in America. Last year they made, I think, 57,000,000 paving brick, and their paving brick is far larger than an ordinary brick. They weigh about nine pounds each. So you can judge the amount of business they are doing. They were burning all coal. Some of their kilns were built with grates in and some without grates, and the burners like the kilns without grates just as well as those with grates, but the fire place was built differently. Down below was the ash pit, and then a piece of brick work for probably 12 or 14 in. with the fire hole up above. It was only about 26 in. back. The coal was all put in the upper hole and the clinkers raked out of the bottom one. On this upper place instead of having a cast-iron door they have a cast-iron frame with a clay block to swing to one side.

Mr. Moody.—I don't see how they could work. I recently saw an 18-ft. kiln with arches 12 in. across and 2½ ft. high. The burner went round every 15 min., putting a shovelful of coal in. When I looked in the arch she was filled with coal right up to the top. I said, "You have got half a ton of coal in there doing no good. You ought to have had your arch turned one-quarter around." He said he knew there was something wrong—he couldn't get the fire through the kiln properly. The man was wasting fuel. He agreed with my idea. There are several different items in burning coal, and a man wants to learn to burn coal properly, and he can learn more in half an hour than he could by talking for two hours, if he goes to someone that knows about it.

Mr. Fox.—There is a great deal of difference in the value of coal for heating capacity. There is a great deal of difference in the method of handling some coal as compared with others. Down at Galesburg they were getting it mine run at $1.80 a ton. We would think that was pretty cheap up here, whether we might get some that was not so lumpy, For that reason it would lay close together and not get the draft through it unless you have grates or something to get the draft even all under it. My own opinion is that unless you watch and keep the clinkers out you won't make a very good burn, even with grates.

Mr. Moody.—We start our coal fire and we have what we call a rake, or poker, and we poke those coals on the grate towards the front of the grate. Then we go back onto what we call the solid bridge wall, there is about 22 in. of that, and we pull those coals out from the back part of the grates and take our shovel and throw a shovel full just immediately behind the grate and one right on the grate. Then we go around the next time and these cinders that we pulled out about six inches on the front of those grates are burned completely out and black and we rake them right out the door. We just keep the coal working that way all the time. We never have the grate clogged up or clinkered, and we have first rate success that way. We keep working the coal from the back to the front, and when we are firing we always make it a point to put the first shovel full right back behind the grates and the next shovel full on the grates, and these clinkers we pull out. The coal is burned completely out. We never have a clogged arch or anything that way. I have found it is the best way to fire with coal. I have tried wood and firing every 15 min. and think that is a failure. We fire about the same as we did with the wood.

Mr. Fox.—I think there is a point that is well worth remembering, as to how Mr. Moody handles his coal by putting the coal on the solid brick work at the back end and by the heat passing in over it you are coking that coal, and when it is drawn to the front it is not all fine coal. You find it more in lumps as if melted together, and it takes a different form, more like coke. The gas has been taken out of a certain amount and burned with the heat from the front. I think that is one reason why a great many have not been able to burn coal successfully, because they throw it in on the front and they get the clinkers behind and the first thing they know the grates are blocked up.

Mr. Moody.—I might say we could fire with coal in that way for two weeks and never have a clogged grate because it keeps coming out. Once in a while we have to clean the clinkers away from the front of the door, to have it convenient and handy, but we never have a clogged grate and we find we can burn coal as good as wood. Our grate is 32 in. long, one end of the grate sitting level with the bottom of the door, so that you can pull the clinkers out. Our grates are lower down, an inch and a quarter in the 32 in., and it seems to have a better draft. We had kilns fixed for wood maybe 17 in. across and 16 high and there were four bricks in there and they projected out on each side. We found that kiln didn't burn half as well as the new kiln built for the purpose of coal. We can burn as quick as anybody else, but we don't approve of that plan. In our big kiln, 24 ft. in diameter, it takes 10 days, and in our smaller kiln, about 18 ft., with the exception of the first kiln in spring, it takes longer. We burn as long as 13 days.

I found out something this summer. I was always wondering why, after the steam was off our ware, that there was several of them cracked, probably seven per cent. Two years ago I built a kiln 24 ft. in diameter and the arches are not very much larger than those in the 18-ft. kiln. We burn 2,960 12-in. tile with a lot of sevens, sixes and threes, and with about $500 worth of tile, we didn't have but $1.10 worth of loss. I came to the conclusion it was in the heating up after the steam was off. I claimed I was heating those kilns up too fast and that was the cause of greater loss in the smaller than in the larger kiln in burning. We don't burn the coal till we get the steam off the kiln. We fire maybe eight hours with open arches, and when we get a bed of coal we continue until we get through. We fire till we see the fire in the chimney, and then close it up and fire every hour and a quarter for the first 18 hours on a tile kiln, and the next 24 hours every hour and a quarter, and then every hour and a half till the kiln is complete. We burn red clay. Our clay would fire flash if we didn't damper the chimneys up. I don't believe in one stationary smoke stack. I believe in four chimneys on the kiln. We have burned our brick with half brick on one side and half tile on the other, and had the brick harder than the tile. We have burned one-third with brick and two-thirds with tile. We have full control over our kiln.

Mr. Fox.—On account of having the different kiln?

Mr. Moody.—Yes.

Mr. Rilett.—When you burn half tile and half brick, where do you put the brick?

Mr. Moody.—Any place you like.

Mr. Anderson.—Did you ever try putting them on the top and the tile on the bottom?

Mr. Moody.—Yes. Our top brick is a little browned from the coal. Our bottom brick right to the floor is really the best brick we have in the kiln.

Mr. Fox.—Do you not think sometimes in heating up when you are steaming—between steaming and what we call getting it heated—and you have the drafts all open and you make it go sometimes between fires and then fire it half, that this would cause a kind of breakage or cracking?

Mr. Moody.—There is where a lot of us differ. If our tile is thoroughly red and split I claim it is the heating up. If it is steam laden it is in the steam.

Mr. Fox.—When you start heating up your fire place is open and you fire half, and then you let it go too long before you fire again, and your heat in the kiln is going up and down, as it were.

Mr. Moody.—As soon as the steam is off we put the fire in the extra arches and we fire up till we get the arches probably half full before we start to coal. We never fill our arches at any time. I think that is a mistake.

Mr. Fox.—You place your tile one size in the other?

Mr. Moody.—Yes.

Mr. Fox.—Do you ever find any of that cracking through their being stuffed?

Mr. Moody.—It depends on how you nest them. We make from 1,000 to 10,000 12-in. tile in the season. We fill the 10-in. tile with threes. We put four threes in a twelve and three threes in a ten. In the eight a five, in the seven a four, and in the six a three. We don't fill the five since we stopped making two and a half.

Mr. Fox.—I find in nesting any of them if we get a tile over to one side and the inside tile is against the other one, it will cause a crack in our tile. We don't nest at all.

Mr. Moody.—Ours will do that if we heat up too fast. I can burn my clay as fast as any clay in the Dominion of Canada if I want to burn it. When you can burn a kiln with $500 worth of tile in five days and there is a loss it pays to burn it longer. It doesn't take any more wood to burn in 10 days than in five, not a particle. Give it time.

Mr. Cornell.—If you are setting clay that shrinks as soon as it commences to heat you can set them closer than clay that swells. You take pure red brick clay and you can set it closer. If I am setting brick in a round down-draft kiln I usually set what would be about five and a half brick on two, not three on three, unless it is a clay that will swell. If it is that kind I would set five on two. I was a little interested in making tile and how to set them and about putting 3-in. tile into a 10. This summer I made about 3,000 10-in. tile for a drain. They told me to put the 3-in. tile into the 10-in. We did so. Those are worth $10 a thousand. In 1,000 10-in. tile you have 3,000 3-in. tile. They are worth $30, $10 a thousand. I came to the conclusion that was not a paying affair, that I was using too much wood. My die was not exactly big enough to allow an eight to go in, but I got a new machine and had to put in a seven. I put 1,000 7-in tile into 1,000 10-in tile. That was $40. I put into that 7-in. tile 1,000 5-in. tile. That was $20; $20 and $40 is sixty. I put inside of that 5-in. tile 1,000 3½ in. tile. That makes $72, whereas in the other case I only got in $30. Now I could take my clay and fill it just as tight as I could fill it and when I go to fire up and take off the watersmoke—just as soon as the watersmoke gets off, which will take a day and a half, I can fire up as heavy as I like and I can't crack a tile or a brick.

Mr. Moody.—If we did that with ours we would have to take them out on the dump.

Mr. Fox.—I have burned tile in my kiln and set them three on three; left the ends open and gave a draft down between and then after we got up five or six rows broke the joint and went over them again so as to tie them together and I have set them five on the length of two and I never found I could make much difference in getting the fire to the bottom; but it may have been on account of not having enough draft in my chimneys. I always found where we crossed them the brick would be far the hardest on the top and probably soft on the bottom. What we want to get out of the kiln is as many face brick as possible.

Mr. Moody.—Did you find in setting the old-fashioned way, five over three and setting the ends tight together, that you had as good a result and as many face brick as by piling them in on blocks?

Mr. Fox.—No. That is the only way in a down-draft kiln to burn them.

Mr. Moody.—Leave them room to expand and you have the same thing.

Mr. Fox.—If you block them in so as to get them heated through and through—if we were to block our white in from wall to wall it would burst the kiln out. We leave them so that the fire can get in between and allow for expansion.

Mr. McCredie—There is a question a friend of mine has which he is much interested in. He has a beautiful white clay and he is anxious to make a good article of the white persuasion. He has been burning coal and he finds that in some of his kilns there is a fine red product that he didn't used to have when he was burning wood. Perhaps some person can tell why or how this is.

Mr. Cornell.—My experience has been in burning white brick that they always come to a red before they come to a white.

Mr. Beckett.—I set five on two in the round kiln.

Mr. Moody.—I would not advice any man doing it that way. I got my first idea about setting from Milton. I set three on top of each other and three the other way and leave a space. We set them that way and they were a little too loose. So just by accident I set the other way. We had a small kiln about 16 ft. in diameter. Set them in there and burned them and burned them and after I thought I had them done I gave them about 12 hours more. When I did that I had the best kiln of brick you ever saw.

Mr. Beckett.—My kilns are burned clear to the bottom. The bottom courses are all good and white, and the rest seem to be all fire-flashed and I can't account for it. I wouldn't think so much of it if it was towards the bottom but it is all on the top. It does not come off in the course of time from being exposed to the weather.

Mr. Moody.—I set three over one and right between those spaces there would be a slight streak like ashes. The only way we could ever get a first-class article was by setting them in blocks. We tier about half way across those blocks and about every fifth tier we bound those. Every five or six tiers we shoved one in. We never have any bother with the tiers falling together.

Mr. Fox.—I am of opinion that the coal gas affects the ware and turns it that color. I know we have had quite a bit of poplar and basswood some years and if it happened to be a little wet and we had it mixed in with the other wood it would kind of whitewash the ware after the kiln would be heated up, and where they touched together, as Brother Moody says, it would be all right, but outside of that you could see this kind of whitewash.

C. H. Bechtel.—I have no doubt if you held the heat on longer it would burn that out. We have found by using a first-class grade of coal without any great amount of sulphur in it we overcame that, by holding the heat on the brick to some considerable extent and burning it off.

THE USES OF CLAY.*

Prof. C. W. Parmelee, New Brunswick, N. J.

A few years ago a table was published which enumerated about ninety separate uses to which clay might be put. It is not exhaustive, and probably was not intended to be, but it is very suggestive and any of us can add many items. Clay is one of our most interesting raw materials, and one indispensable to man's comfort. All races, of all times, and of all lands, have found this plastic material beneficently adapted to their uses, and with the march of civilization and multiplication of our wants, we find increased need for the old wares and constant addition of new.

By the way, we do not often find poets among brickmakers, almighty did not, namely, that clay was pretty good material to fashion men of, and there we have what you and I may be justified in considering as after all the most important use of the commodity. Without argument, we will all agree that there are all kinds of clay, and all kinds of men, and if the bad men make as much trouble in the drying and burning hereafter, as their clay counterparts do here, we extend our sympathies to the kiln-man. The poet tells us that there is "the porcelain of human kind." We know such, we have met them, good fellows, and who ring true and stand out peers in this old china shop of a world.

By the way, we do not often find poets among brickmakers, although this Association found a laureate in the late Mr. Dunn, as the members can testify. But it is curious to note the poets who have gone down into the clay pits. There was Shakespeare and Dryden, and Byron and Tennyson, master-craftsmen in their work—good company for any member of this Association. With them the clay is linked in thought with this "Earthly tabernacle of flesh." You practical men could have helped them with suggestions, which would have given even more homely application to their imaginings. Is it not "sand" that improves both man and clay? Does not the weathering of years of storms and stress improve good men, as it improves good clay? It seems to me that the compiler of that list of the uses of clay should have mentioned its value in poesy.

Have you ever found any music in that word clay? Does it appeal to your sense of harmony, soothe your troubled spirit and drive away your cares? Clay! What is the magic in the word? It must have some tender claim upon the affections. Why else should the sovereign people of eighteen of these United States by an enlightened and untrammeled choice select that word as the legal titles of eighteen shires. North, South, East and West, we find clay counties touching elbows with Washingtons and Hamiltons and Jeffersons. Perhaps, who knows, when the great Territory of Alaska is partitioned into states, we may find one among the bevy made illustrious among its compeers by its title Clay. Let the Association look to this opportunity to bring credit upon itself, and add another illustrious name to Columbia's roll. Now, gentlemen, there is a use for clay neglected by the compiler of the list. Some of you may remember the story of the man who was anxious to learn the distance of a town in one of the remote sections of the South. He asked the first citizen whom he met, who briefly replied that it was two looks and a holler. The stranger asked the sage for an interpretation, and he learned that his road led to the top of one hill, that was the first look; from the top he could see another hill, which vision constituted the second look, and at the top of that hill he could halloa and the town would be in range of his voice. Just so we can arrange the history of the world in three chapters. Chapter One—the first look is that period of which we have definite record; Chapter Two—the second look—is partly record and partly conjecture, going back to the Garden of Eden; Chapter Three, is all that goes before, concerning which we scientific men holler a good deal about in our theories. The history of all three of these chapters is written in clay. When the first rock arose above the water on that first day of the world, it immediately began to undergo the changes that converted a part of it into clay, which in turn became rock, and again clay, and so on even through our time. Some of you brick-makers may be working with the plastic remains of that old continent. When man walked out of the Garden and joined the labor union, one of his earliest amusements in his hours of leisure seems to have been dabbling in clay, very much as children naturally undertake making mud-pies, and probably with about the same amount of satisfaction and artistic success. From these humble beginnings have followed improvements down to this day and generation, so that the student may determine by a careful study of the potsherds the history of a people—their origin, wanderings, their commerce and development, their laws and wars, their ideals and their decay. Think of the Cesnola collection of Cypriote antiquities, with its almost innumerable specimens telling the tale of 2,000 years and told so that he who runs may read. Think of the romance of it all. How the Egyptians invented enameling, and told it to Nineveh and Babylon, where Persia learned the art and transmitted it to China; China gave it to Korea and Japan. The Arabs learned it in Assyria, and carried the knowledge with their conquest among the tribes of Northern Africa to Spain. The Saracen taught the Italian, who taught the French. Germans learned it from them and handed on the precious knowledge to the Dutch, and thence to England. As one writer aptly says, "The cups on our tables are lineal descendants of the cups used by the ancestors of the builders of the Pyramids." A child is sometimes told to hold a shell to his ear, and hear in it the sound of the sea. The same deep sound, which one may hear in any vase of Chelsea, or Derby, Sevres or Dresden, Minton or Copeland, coming down through a long succession of generations of pottery, is "the roar of the deluge." We pause, and it is worth our while to consider the written record on clay. Scientists delving in the rubbish heaps that now makes the site of ancient cities frequently uncover the imperishable records of ancient life; bricks covered with the decrees of kings, the accounts of merchants, the tender pleadings of lovelorn suitors. A Carnegie was sorely needed in those ancient days to provide, not shelter, but storage space. We are free to speculate that those ancient peoples were spared the strenuous life, and had the necessary time to look around the brickyard when they wanted to refresh their minds on some data.

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*Read at the Birmingham meeting of the N. B. M. A.

Now, gentlemen, let us leave the ancients and come down to this year of grace. After I began to think upon the subject of the uses of clay, the more I became impressed with the helplessness of man without it. Why, he positively must have it. There are three things which man has to have, namely: Food, clothing and shelter.

Let us consider the first item, food. For that we must look to the land, and it would be sorry farming if the land did not contain a proper proportion of clay. Not too much, for that would be as unfortunate as too little. But the land must contain clay, because of the important functions which it fulfills. In the first place, it retains moisture, which in the dry times serves to keep the fields and meadows green, and saves the crop from being withered by the sun. It absorbs the atmospheric moisture, prevents a plague of dust and gives the evening coolness that is the balm for the woes of the summer's day. Moreover, it has a retentive effect, without which the enormous quantity of water flowing annually through the soil would speedily exhaust the store of invaluable mineral salts, and reduce the farms to absolutely barren wastes, and make the ocean saltier than the Dead Sea. Finally, there is the absorptive power of clay, by which it lays hold upon the odors of corruption and in their place returns the fragrance that rises so pleasantly after the spring showers. Pause, when you drink again from some favorite spring, and consider the service that clay in soil has done in purifying and sweetening the draught that you drink. Now, for the mastication of the food that we have all this time been growing. Nature has equipped us with teeth. Unfortunately, she stopped with one set, and when we need repairs we must consult the dentist. Just how largely the national tooth falls short of giving satisfaction, is shown by the statistics. That is, 8,000,000 artificial teeth are made annually in this country, and this condition of things will grow worse rather than better. Without clay for this use, the awful fate of the Nation would be breakfast foods three times a day—a thought too horrible for contemplation. (Laughter).

The use of clay for utensils of domestic service is too well known to need comment or eulogy. Can you imagine a table unadorned by useful or ornamental clay-wares? It would look strange, would it not? We can all enthuse over specimens of the potter's art, and we do find that their presence gives zest to our appetite. It is just as well to satisfy the cravings of hunger before you gratify your desire for knowledge, else you may turn from the bread, because the flour may contain a considerable percentum of clay, added to make good weight. The use of earth for food adulteration is no new thing, for according to historians, ancients practiced it, and today every now and then some ingenious scamp finds a new opportunity to ply his art, with up-to-date improvements. The condiments seem to present the best opportunity, as we find mustard so adulterated, also artificial pepper corns molded of clay and pepper, and as a climax, red pepper mixed with brick dust. Beeswax and tallow are frequently found to contain substantial additions of clay.

It is in the construction of shelter, that man finds the largest application of clay. He has used it for all types of building, from the little adobe hut to the acme of architecture, the skyscrapers. What a diversity of color, form and decoration may be had in brick! How well it lends itself to the development of architectural themes, be they the little dwelling, the imposing pile of the university, or the soaring office building. No longer do we have to wander block after block past houses each like the other in size and detail. Instead, we may find a pleasing diversity, harmonious and attractive, for the builder has at his command an abundance of material of any shape or color that he may desire. Have you paused to consider the enormous number of common brick yearly manufactured—just the common, ordinary red brick, made in any old way, and of all sorts of material? The statistics for the year 1903 give 8,463,683 thousands, and it was not a good year, either. Those are big figures, and hard to grasp, but if you will take your pencil and do a little figuring, you will find that number of brick of the standard length, placed end to end, would girdle the earth at the equator forty-four times, or make a wall there eight feet high. Or you could lay a path to the moon of the width of four bricks. The product of the past three years would furnish material enough to make the walk nearly three feet wide, one which the Brickmakers' Association might march on to visit their lunar craftsmen, if there be such.

As for paving brick, the output during the same year was sufficient to build a boulevard fifty feet wide, reaching from New York to Galveston, Texas.

I cannot touch upon the other materials of construction, for our time is too limited, and their merits are already too weel known. It is a pleasure, however, to speak a word of appreciation of architectural terra-cotta. What a wonderful material that is! How perfectly it may be shaped and colored to satisfy the special need. What an ideal medium for the expression of the sculptor's conceptions! And with all these, possessing unrivalled powers of endurance, defying the ravages of time, all our cities attest the artistic worth of this material.

Not only the exterior of man's dwelling may be ceramic, but the interior also, the drainage system, the protection against fire, the floors, the decorated walls and fire-places, the door-knobs, gas logs and all sanitary devices. In recent years pottery certainly showed no more striking development than in this line of sanitary ware. With the assistance of the tile-maker, he achieves artistic results that would appeal to the Imperial Caesars. With cleanliness next to godliness the sanitary potter is a high priest of right living. If paint is used about this house, it may be a product in the manufacture of which clay has been used, as is the case with ultramarine, or a calcined iron-bearing earth, such as the browns of Sienna, or the clay may be present in the mixture simply as an adulterant. If cement has been used as mortar for the bricks, or for walks, clay may have been used as one of the components. The paper that hangs on the wall is heavily loaded with clay and the colors printed on its surface is largely mixed with this material. There is a multitude of other atricles of use or adornment to be found about this house, which we will not enumerate.

As for the clothing of man, we may logically say that he gets it by aid of the clay soil that grows the cotton or furnishes grazing for the sheep. The spinning and weaving is done on machinery having clay-ware guides. In the finishing of cotton goods, clay is used to give weight, but chiefly a good surface. It is very doubtful, indeed, whether certain large lines of cotton goods would have any sale if it were not for the assistance lent by this material in making them more attractive. The practice of adding clay to the size is said to have arisen during the times of scarcity of cotton fiber, in the days of our Civil War. It was first employed as a make-weight for the goods woven for Eastern markets, but by virtue of its excellent qualities it has won recognition which removes it from its original rather disreputable place as an adulterant, and dignifies it with a real value.

As I have said, the ancients found the clay tablet or brick most convenient material on which to record their transactions. With all the improvements of the centuries which have passed since that day, we have not succeeded in dispensing with the services of clay in this particular. In fact, it is not at all improbable that we use more clay annually in recording our daily transactions than was ever used before. This difference lies solely in that, instead of writing on clay, scratching the surface of a soft brick with a sharp stick, we have mixed graphite with clay for the leads of our pencils, and every stroke of the pencil leaves a small deposit of both upon the surface of the paper. For this use the clay chosen is of the nature of a pipe clay, strong and smooth. It is carefully floated, dried and mixed in various proportions with the graphite. The harder the pencil, the larger the proportion of clay. The mixture is ground out, filter-pressed, and pressed into form, and these are fired in crucibles which are carefully sealed. The especial value of clay for this purpose is said to lie in the property which the particle has of shrinking upon drying and firing. Thus it happens that each particle touches its neighboring particle of graphite at only a few points, leaving the graphite particle free to be rubbed off by abrasion.

There is a story told of a certain prominent citizen coming out of a saloon, and meeting a lady friend, who was a warm advocate of temperance. She remonstrated with him in this fashion: "Colonel, I am inexpressibly grieved and shocked to see you coming from a saloon." The Colonel answered, "Why, Madam, you could hardly expect to have me stay there all the time." Just so with this paper; there is much more to be said, but no reason why I should attempt to tell it all. You have been good enough to bear with me, and I am willing to reciprocate by retiring after a few more words.

Clay finds large use in the manufacture of emery wheels. Mixed with oils it is sometimes used as a lubricant, and, finally, it is sometimes used for lining safes. May all the members of the Association have an opportunity to prove that.

MAGNESITE AS A LINING FOR FIRE-BRICK.

Magnesite, calcined in an electric furnace, and used as a wash on the fire-bricks lining a melting pot in a calcium-carbide furnace, stood the heat for 200 hours without repair, whereas the bricks that were unprotected required repair after a five hours' heat.

BRICK DRYERS AND KILNS.

There has perhaps been more money spent in trying to perfect brick dryers and kilns by various manufacturing concerns then on any other equipment pertaining to the manufacturing of brick.

Brick dryers and also brick kilns apparently seem to be very simple to design and erect by the average brick manufacturer, but frequently, after being put in operation, are found lacking in a great many respects. The proper arrangement of the flues of both dryers and brick kilns is always very essential to give an equal distribution of heat in all parts of the kilns. In order to maintain an equal circulation it is not necessary to have a complicated arrangement of flues, stacks, dampers, etc., which invariably increase the cost of construction and maintenance and are also more expensive to operate. In brick kilns it is not necessary to have more than one or two dampers to control a kiln of any desired capacity, provided all details are installed in the proper manner and the kiln and furnaces are properly proportioned; the less complicated apparatuses the average brick-burner has to contend with, the better are the results which he will obtain.

W. C. Mitchell, Dryer and Kiln Expert, Edwardsville, Ill.

I have remodeled dryers using the same apparatus for furnishing the heat and secured from 25% to 50% more drying capacity out of the same number of drying tunnels by simply changing the arrangement for distributing the heat and also the circulation.

The question has often been asked me, whether it is practical and economical to dry dry-pressed brick before setting same in kilns. To this question I will say that it is unquestionably the best to always run your dry-pressed brick through drying tunnels before setting them. And in most instances there is less danger of checking them in a properly constructed dryer than there is in the kiln after being set. When brick are set in a kiln after being thoroughly dry the long and tedious drying process is entirely eliminated and the susceptibility of checking and sooting the kilns is reduced to the minimun point. Your kiln capacity is increased from 40% to 50% as well as your fuel bills.

This article is not written on theoretical ideas, but has been proven by absolutely practical experiments and tests with various clays and conditions.

LIME AND ITS TREATMENT AFTER HYDRATION.

So much interest has been displayed in this subject that data has been collected by correspondence from various members of the National Association of Sand-Lime Products, as to their opinions on this subject, which are as follows:

Diamond Stone-Brick Co., Wilmington, Del.—"The question of the treatment of lime is one which depends largely upon the kind of lime used. We are using a very high calcium carbonate which contains less than 1 per cent of magnesia and are hydrating the lime before mixing with the sand, doing so very successfully, as, since we have adopted this method, we have had no broken bricks or cracked surfaces coming from the hardening cylinder."

Genessee Sand-lime Brick Co., Genessee, Pa.—"The lime we use has considerable magnesia. We hydrate our lime in a hardening cylinder, putting enough water in each car of lime to start the hydration, with very satisfactory results. After hydration, we run it through a 1-in. screen to the pulverizer and then to the hopper which feeds the automatic measuring machine, then through mixers to hopper feeding press."

Sibley Brick Co., Sibley, Mich.—"The only proper way to treat lime for hydration is by steaming the lime in the kettles after adding an equivalent quantity of water. We use a lime containing about 94 per cent CaO, 4½ per cent MgO and the remainder sand and ½ per cent $Al_2O_3Fe_2O_3$. The lime is treated by the Komnick process."

Saginaw Sandstone Brick Co., Saginaw, Mich.—"There are a great many different ways of handling lime for hydrating. The simplest, we believe, is to put your lime in proper boxes, add sufficient water for thoroughly slaking, then put it into the hardening kettles under your brick cars. Leave it there during the time that the brick are being hardened, and the lime will then be ready to pulverize. We use a quick slaking lime which contains a great deal of magnesia. We are told that it analyzes as high as 24 per cent of magnesia, our local dealers here having had an analysis made."

The Silicated Brick Co., Denver Colo.—"Our lime is a high grade of calcium lime which we prepared for use by prior hydration."

King's Crown Plaster Co., Cedar Rapids.—"We hydrate our lime in a cylinder under high pressure of steam. We use the Viola lime, made in Iowa. We treat it by adding 80 per cent of moisture. The lime comes out very dry and is run through a lime pulverizer. The analysis of our lime shows about 50 per cent magnesia."

Tennessee Granite Brick Co., Memphis, Tenn.—"We use the Huennekes process, under which the lime is mixed with sand first, in a tube mill, moistened after it leaves the tube mill, and the process of hydration completed in a silo or storage bin, where the material is allowed to remain for 24 hours before it is pressed. We have obtained fair results with this system. We use Alabama lime. We crush it and feed it through a measuring machine into the tube mill with the sand which is to be ground."

American Sand-Lime Brick Co., Chicago, Ill.—"In all the plants we have installed we use hydrated lime, hydrating it at the plant before mixing with the sand. This we have found, from practical experience with many different kinds of sand, to be the safest method for general use, and by this method we have used both high calcium and dolomite lime with equally good results."

Sharp Sand Brick Co., Columbus, O.—"We are installing our plant with the intention of using a prepared hydrated lime, which is prepared by steam. This lime has all unburned lime and core taken out and furnished in an impalpable powder, in paper sacks."

The lime analysis is:

Calcium carbonate	92.64
Magnesia	4.75
Silaca	1.30
Iron oxide alumina	.28
	98.97

Holland Brick Co., Holland, Mich.—"I have hydrated lime in several ways. Am at present adding about 30 per cent water to the lime and depending on the moisture contained in the steam to supply the balance of water to give perfect hydration. Am getting very good results. Am using lime analyzing high in calcium and hydrating under high steam pressure in tank or cylinder."

Geo. E. Dean, DeLand, Fla.—"I have tried the hydration of lime by three different processes.

"First.—The hydration of lime in the sand, which we are now using in our mill. This works all right if you can secure a very high grade of lime, one that is 98 per cent, or better, pure. A high calcium lime is always required in the method of handling lime. A lime containing any great quantity of magnesium will swell the bricks and cause trouble in this method.

"Second.—The hydration of lime in the cylinder with the brick, where you wish to use any kind of lime that is a good lime and not containing quite so high a percentage of calcium, is, I think, the most desirable way at present.

"Third.—I have also tried the so-called hydrated limes that are on the market at present, but am not as yet ready to recommend them. This latter process I should prefer when we get a lime that is thoroughly hydrated. The ease with which it could be handled around the mill would make it very desirable as well as it would make your mill a better insurance risk. Our lime runs 98.4 per cent pure, and we are hydrating in the sand."

The Paragon Plaster Co., Syracuse, N. Y.—"We have adopted the Komnich system and our lime is hydrated in trenchers, according to the German custom. Profiting by what experience has taught us in the handling of lime for our plaster business, we would, assuming the lime is hydrated (no matter by what process), pass it through a grinder, then to a bolter and to a bin to be drawn from as required. The tailings could be accumulated in a reasonable quantity and mixed with the fresh lime as it is hydrated. When this comes through the second time, if there still remains any core, whether it is stone or improperly burned lime, we would throw it away. We would also provide a proper screen so that no large pieces of stone or any foreign matter, such as nuts, bolts, etc., could enter the grinder. The best device that we can suggest as a protection to a machine of this kind is a magnetic separator. We have them in use and they will catch anything from a tack to a fair sized monkey wrench. While they are somewhat expensive, they are efficient and always "onto their job," which cannot be said of the average workman. We are well aware that in some places a grinder is eliminated, and this can be done. A large double reel with coarse mesh on the inside to catch core or lumps, without dropping them onto the bolt screen proper, works admirably in several places, as we know. The percentage of tailings is, we think, increased. So much depends upon the lime that what we have threshed out in our way may not be applicable to many who are working under different conditions and with different limes."

EARLY HISTORY IN SEWER PIPE MANUFACTURE.

Mr. George H. Hartwell,
Chicago, Ill.

My Dear Hartwell:—Some time since I promised you certain memoranda regarding early sewer pipe making, and beg your pardon for the delay. However, better late than never. I herewith make you a few notes, part of which was printed a few years ago.

In early sewer-pipe making in U. S. A. prior to 1852, all socket dies were made by first pressing a straight pipe or tube and putting a separate piece of clay around one end and sloping socket by hand, or enclosing the tube in a husk or crate that was in halves, hinged on one side and with catch on the other side to lock it tightly around the tube. This crate was then placed endwise in a vertical position on a wheel very much like a potters wheel plate and the socket was turned on the upper end of the tube that projected through the crate in the same manner as pottery on a turning wheel. This style of making socket dies was carried on in certain parts of the country up to and into the nineties.

The presses for making these tubes were of various kinds, viz., screw, rack and pinion, hydraulic, and one press was of peculiar design, having one 60-inch cylinder 10 or 12 ft. long; the bottom head having several holes under which ring dies were bolted. The operation of this press was to load the cylinder full of clay, packing it in solid, put in a head, and by rolling up a cloth roll and placing it around the edge of the head in the cylinder it formed a sort of ring packing, after which the top head was set on, bolted to place, pumps started and water forced between the top head and piston. This of course pressed the piston head down and pressed the pipe, after which sockets were made as mentioned above. After the clay had been all pressed out of the cylinder, the top head was removed, the piston lifted out by rope blocks, the cylinder again filled, and the operation of pressing repeated. This machine was owned and operated by Moorhead & Co., of Philadelphia, in their factory at Spring Mill, Pa., and later owned by Harvey, Moland & Co., who took it down and disposed of it.

The first steam press designed to make socket sewer pipe was built in 1851, and to clear up the question of priority so far as we are able to learn, the first steam sewer pipe press was designed, or rather the plans were brought from England, under English patents, granted to Thomas Spencer, British patent office, April 10th, 1848. Machine for manipulation of pipe or tubes from clay or rather plastic material which formed a socket on the pipe, viz., pipe and open dies, by a man named Williamson in 1850, and press was built by Ayers & Mott, New York City, subsequently in 1851. It was erected in the factory of Washington Smith on W. 19th St., New York City (then known as Greenwich Village), same being later owned by Stewart Ceramic Co. This machine had a steam and clay cylinder in vertical position and the socket die was built with square base and slide. The cheek pieces forming the socket were hung on the slide and being in two pieces, when a socket was pressed the cheeks were opened and removed from the pipe by slides, leaving socket standing clear. The steam was then turned on and pipe pressed the desired length when the pipe was cut off by a wire. The disc rod was operated below the floor line. This press stood in its original position until 1886, when it was supplanted by one of The Turner, Vaughn & Taylor Co.'s 40-inch machines. In 1856, E. H. Merrill was associated with Mr. McMillan in the pipe business under the partnership name of McMillan & Merrill, operating the Black Mills at Middlebury, now east Akron, Ohio, using screw presses. Hearing of the machine in operation in New York Mr. Merrill secured plans of the press and Calvin J. Merrill, with the late D. B. Hill, of Akron, and others, had the second sewer pipe press to make socket pipe, built by the late Ozias Barber, in Akron. This press was not erected in Akron, but was taken to Upper Alton, Ill., where Calvin Merrill, in the partnership of Merrill & Clark, associated with Mr. Hugh M. Thompson, of St. Louis, set it up in 1858 It was remodeled from time to time until 1881, when it was removed to Des Moines, Ia., Mr. Merrill at this time associating himself in the Iowa Pipe and Tile Co. of that place. The press was set up here and operated until 1895.

N. B.—There have been reports of two other presses being built by Ayers & Mott under Williamson's plan, but I do not think there is any foundation in same, at least their location has never been determined, and if any of your readers know of such machines I would be pleased to have information regarding them.

The two presses mentioned as having been built, first that for Washington Smith, the first in the U. S. A. in 1851, and second that for C. J. Merrill, first machine west of the Allegheny mountains in 1858, were subsequently replaced by the Vaughn press built by The Turner, Vaughn & Taylor Co. in New York, in 1886, and Des Moines, in February, 1895.

In 1858, David Fosdick was operating an hydraulic press at Goose Lake, Ill., and Mr. H. B. Camp, of Akron, O., was with him, and in 1860 Mr. Camp came to Northampton, Summit County, O., and in 1864 he came to Cuyahoga Falls, O., and engaged in manufacturing sewer pipe on one hydraulic press, and in 1869 the second press was installed.

In 1867, W. B. Walker & Co., of Chicago, installed an hydraulic press at their factory, and in 1872 this machine was placed in the Buckeye Sewer Pipe Co.'s plant, at Akron, O., and in 1873 it was replaced by a 40 x 20 inch steam press built by The Turner, Vaughn & Taylor Co.

In 1869, The Turner, Vaughn & Taylor Co. placed a 36 x 18 inch double clay cylinder steam press in Freeman Brothers' plant, at Freeman Station, on the Ohio River. This was the first steam press in the Ohio River territory.

Up to 1866 all socket pipe were either made by branch makers or potter wheel and later by open cheek dies on square bases, at which time the solid die for forming sockets on sewer pipe was brought out by The Turner, Vaughn & Taylor Co. The first experiment was made with a ring inside the socket, which did not prove satisfactory, and subsequently the air vent valves were perfected. This was a far-reaching improvement and became common property of the machine men as soon as known, and still remains the only successful socket die.

To repeat, April 10th, 1848, patents were granted by British patent office for sewer pipe machine.

Prior to 1851 all sockets on pipe in U. S. A. were made by hand.

1851 first press to make socket pipe in U. S. A.

1857 first press to make socket pipe west of the Allegheny mountains, by C. J. Merrill.

1864 first hydraulic press for socket pipe in U. S. A., built by The Turner, Vaughn & Taylor Co. for H. B. Camp.

1866 first solid die with air valves in U. S. A., built by The Turner, Vaughn & Taylor Co., and used by H. B. Camp on his hydraulic press.

1869 first steam press built by The Turner, Vaughn & Taylor Co. Yours very respectfully,

C. Vaughn,
Cuyahoga Falls, Ohio.

PITTSBURG CAPITAL TO MANUFACTURE AN ARTIFICIAL BUILDING MATERIAL.

Strong claims are put forward for a manufactured stone which a number of Pittsburgers will soon start to produce here, the machinery and equipment having already been ordered. It is claimed that in this stone architects will find at a moderate cost a substance which possesses all the native beauty of natural stone with a superior degree of resistance to moisture and dirt, and entire absence of liability to damage from weather conditions of any kind.

The company which will manufacture this article is known as the Standard Stone Company, of Pittsburg. Its president is C. F. Buente, who has been engaged in the stone business in this city for some years. D. Walter Bell is secretary and treasurer of the concern, and Thaulow Gjertsen is chief engineer. It is proposed to establish a plant with a capacity of 1,000 feet a day. The machinery has already been ordered and it is expected will be installed in about a month.

The stone is made under patents granted to a Philadelphian. While part of the process is made open by the fact that there are patents on it, there are other parts not disclosed. The process of manufacture is a combination of casting and chemical treatment.

The process for the manufacture of white stone would consist of first crushing and rolling marble to a granular form. This is then mixed dry with a high grade Portland cement in certain proportions. Water is added in sufficient quantity to render the mixture liquid and an agitator operated by electric power thoroughly mixes the various constituents.

From the agitator the mixture is run into sand molds, such as are commonly used in foundry practice. As complicated designs in the way of capitals, architraves, cornices, friezes or stone for belt courses as can be made from metal are in this way molded, the size of the stone produced is practically unlimited.

This sand mold is prepared as in an iron foundry. Its peculiar characteristic, however, is that it is saturated with a chemical solution. The property of this solution is that it prevents the formation of the common "magnesia" deposits—white patches often seen on the face of stone or even brick. The hardening stone should remain in the mold a week, and during that time the sand mold is kept saturated with the solution. Through the chemical effect the substance hardens, crystallization is perfected and the finished article is claimed to possess in an eminent degree the best qualities of building stone.

Upon its small absorption capacity depends much of the excellence of this material. It is said that by engineering tests the water absorption is from 5 to 7 per cent. This being so small, it follows that the dirt which frequently is drawn by capillary attraction into the very structure of the stone will not act as badly in this material, and for that reason the stone can be cleaned with great ease, soap and water sufficing.

The new stone "works" like limestone under the chisel of the stoneworker. If a figure is complex, it can be cast approximately for undercutting and finished by the mason.

In the matter of cost it is stated that the new stone is produced at a fraction of the cost of granite, both materials being worked and ready for placing. On this account it is believed that there is a wide field for its application. Instead of dealing with a substance, to work which will require great time and labor and reach in cost oftentimes a prohibitive figure, an architect will have a stone which, possessing all the beauty and uniformity of color of the natural substance, will be so shaped to fit his ideas that structures of even a modest character and cost need not go unadorned.

NEW BRICKMAKING PROCESS.

(From United States Consul Stephens, Plymouth, England.)

The Plymouth and Stonehouse Gas, Light and Coke Company has just started a new process of brickmaking from two of its by-products—clinkers from the furnaces and spent lime from the purifiers. The works are the first installed in England and have created a large amount of interest.

First mixed with a proportion of clinker (about one-fourth of lime to one of clinker), the lime is raised into a calcining tower and converted into carbonate and silicate of calcium. It is slaked with water, mixed with a further proportion of clinker (about two of clinker to one of calcium material), and then passed through a temporary mill, the proper amount of water being added. By another elevator it is carried to a platform and delivered into a toggle press, which turns out the manufactured brick in a soft form. Placed on wagons, the bricks are run into an autoclave, a large tubular vessel capable of holding 7,000 bricks. Here they are subjected to a pressure of about 110 pounds for upwards of twelve hours, following which they are stacked and ready for sale.

The bricks are said to be of a higher quality than those produced in the ordinary process of manufacture, their resisting strength being about 350 tons to the square foot. The absorption of water is small, from 4½ to 5 per cent, which compares very favorably with the ordinary brick. These bricks have been rigorously tested by an engineering expert of London; have been alternately frozen and thawed, and subjected to the regular acid tests. He reports them to be entirely satisfactory.

CLAY POT WORKS TO BE IN NEW HANDS.

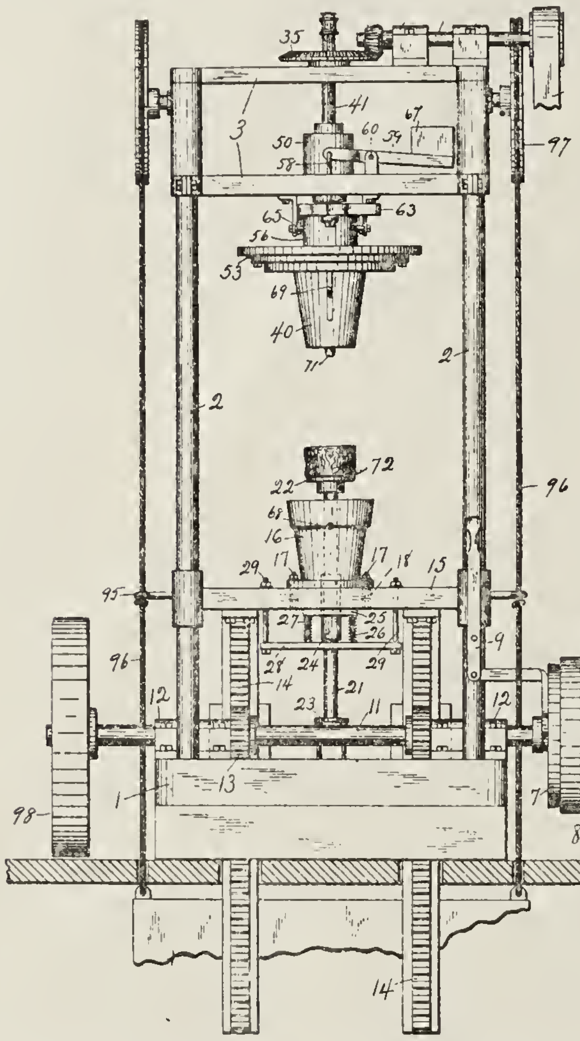
A deal has been consummated by which the Marion (Ind.) Clay Pot works passes from the hands of J. R. Keenan to Messrs. Reeser, Price and Cramer of Findlay, Ohio. The consideration has not been made public.

The Marion Clay Pot works, corner of Thirty-third and Washington streets, was started over two years ago, but during the past year has been dead. The new proprietors will at once commence operations and the factory run at its fullest capacity. In addition to the manufacturing of clay pots, the business of producing concete building blocks will be added and as soon as the necessary additions are completed and the machinery installed the factory will employ more labor than ever before. The operation of this plant will be of great benefit to South Marion, and residents of that part of the city are profuse in their welcome to the new management.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

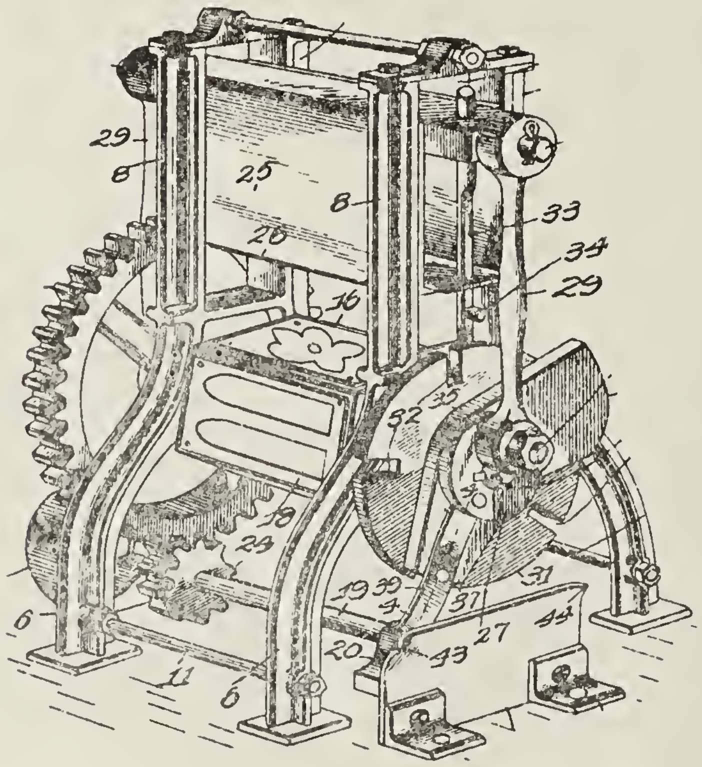
These new inventions are those that are especially of interest to any one engaged in the line of building materials and their manufacture, or machinery to make them.

780,856. Molding-Machine. Conrad Breitschwerth, Syracuse, N. Y., assignor of one-half to James C. Butler, Syracuse, N. Y. Filed Oct. 9, 1902. Serial No. 126,589.



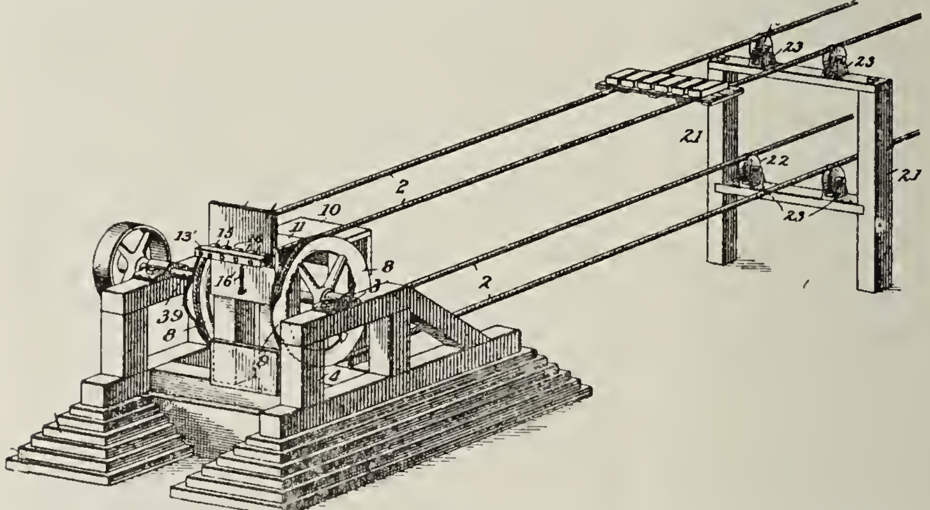
Claim.—In a machine for molding clay vessels, the combination with a concave mold and a convex core fitted thereto, of means to support the core and mold, means to force them together to form the clay arranged between them and means to introduce compressed air through openings in the core-bottom to the inner surface of the vessel, to release the vessel therefrom.

780,435. Tile-Press. Max Mueller, St. Louis, Mo. Filed Aug. 22, 1904. Serial No. 221,734.



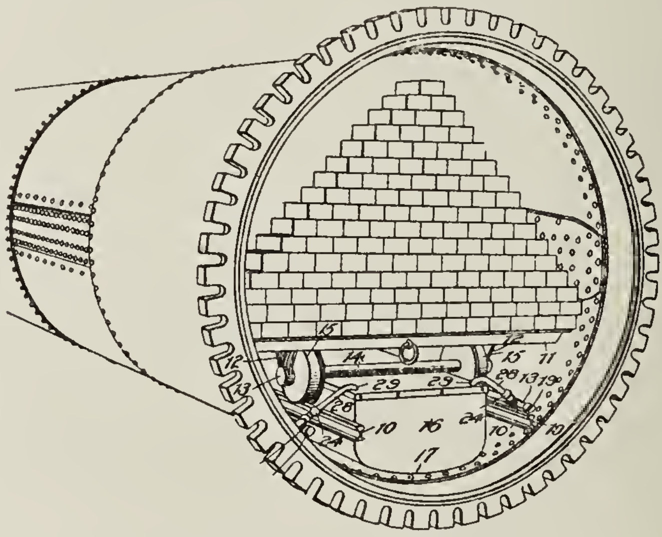
Claim.—In a tile-press; a rotary die-holder; a shaft extending through the die-holder; crank-pins carried by the shaft; a reciprocating die-holder; connecting-rods connecting the reciprocating die-holder to the crank-pins; a notched wheel rigidly connected to the rotary die-holder; a sliding plunger carried by the reciprocating die-holder in position to engage in the notches of the wheel; a pin projecting from the sliding plunger; a cam-hub fixed upon the shaft adjacent to the notched wheel and having a cam-face to engage the pin and operate the plunger; a notched arm extending from the cam-hub; a leaf-spring attached to the hub; a tooth carried by the leaf-spring in position to engage in the notch of the arm and in the notches of the notched wheel; and a cam-plate rigidly mounted in position to engage and operate the leaf-spring; substantially as specified.

781,120. Brick-Conveyor. William P. Alsip, Grand Forks, N. D. Filed May 16, 1904. Serial No. 208,153.



Claim.—In an apparatus of the class described, a pallet, an endless conveyor, means for supporting and guiding the conveyor at its outer end and at intermediate points, means for loading a pallet and supporting the same above the conveyor, and means arranged at one end of the conveyor for driving the same and for automatically transferring the tray from its position above the conveyor onto the conveyor, substantially as described.

781,372. Apparatus for Slaking Lime. Morris Sherman, Chattanooga, Tenn. Filed Oct. 20, 1904. Serial No. 229,345.

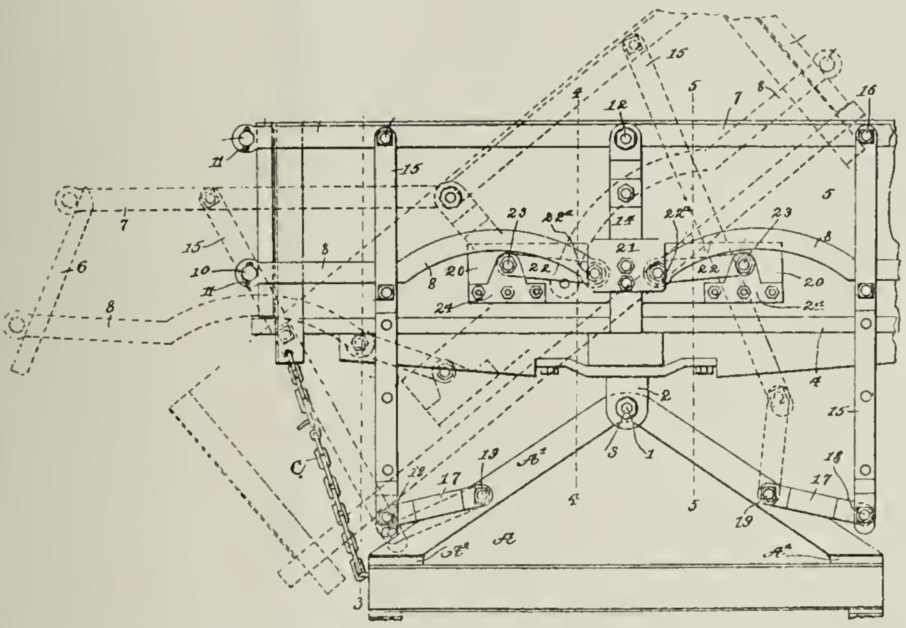


Claim.—In an apparatus for slaking lime, a container, a receptacle therein, a water-supply main asociated with the container and a movable discharge-pipe located within the container and connected to the main and adapted to be moved into and out of position to discharge water into the receptacle.

In an apparatus for slaking lime, a container, a receptacle therein, a water-supply main associated with the container, a movable discharge-pipe located within the container and connected to the main and adapted to be moved into and out of position to discharge water into the receptacle and means whereby the movement of the pipe into discharging position permits the water to flow therethrough and whereby the water is cut off when said pipe is not in position to discharge into the receptacle.

781,577. Dumping-Car. William W. Wallace, Knoxville, Tenn. Filed Dec. 12, 1904. Serial No. 236,466.

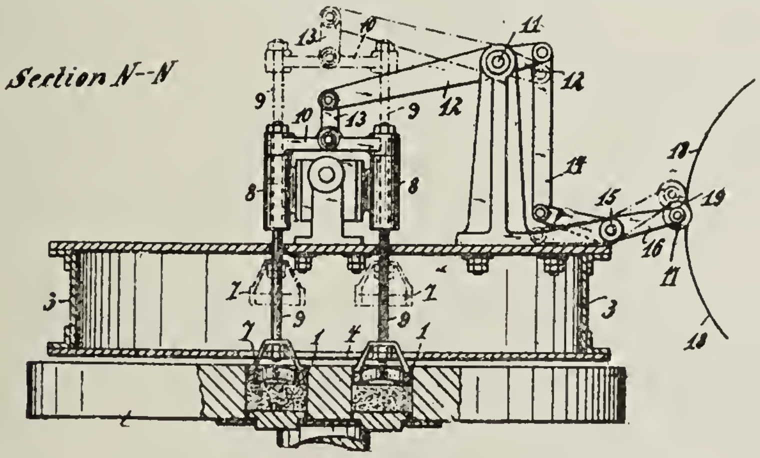
Claim.—The combination with an underframing and a tiltable car-body mounted upon said underframing and comprising a movable side door, of bars, 7, hinged by their outer ends to the upper portion of the doors and by their inner ends to the car-body, bars, 8, hinged to the lower portion of each end of the door and joined to the car by a laterally-shiftable connection, whereby they are made laterally shiftable with reference to said bars, 7, and thereby adapted to permit the lower edge of the door to move away from the car-body farther than the upper edge of the door moves, substantially as described.



The combination with an underframing and a tiltable car-body mounted upon said underframing and comprising a movable side door, of bars, 7, hinged by their outer ends to the upper portion of the door and by their inner ends to the car-body, bars, 8, hinged to the lower portion of each end of the door, and links, 22, each hinged by one end to the inner end of one of said bars and by its other end to the car-body, and mechanism for lifting said bar, 7, substantially as described.

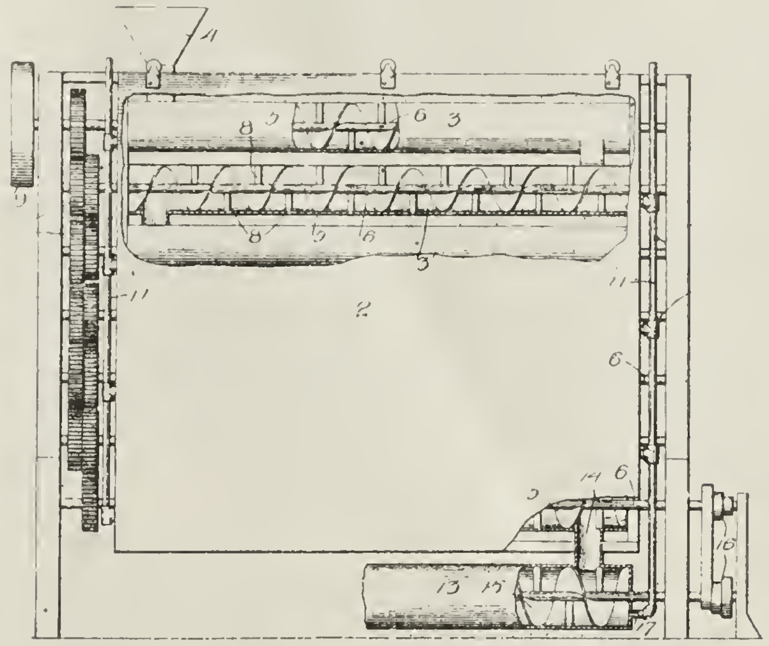
782,602. Apparatus for Making Bricks. Johannes Draenert, Eilenburg, Germany. Filed June 2, 1904. Serial No. 210,794.

Claim.—An apparatus for making bricks having very hard corners and edges consisting of a holder for the material, a table having a series of molds therein, to rotate under said holder, wings and outlets in the said holder, through which the material is fed to the molds, reciprocating frame-shaped dies to fit into said molds through said outlets, and means for reciprocating said dies and rotating said wings to first fill the mold, then stamp down the edges and then refill the mold, substantially as described.



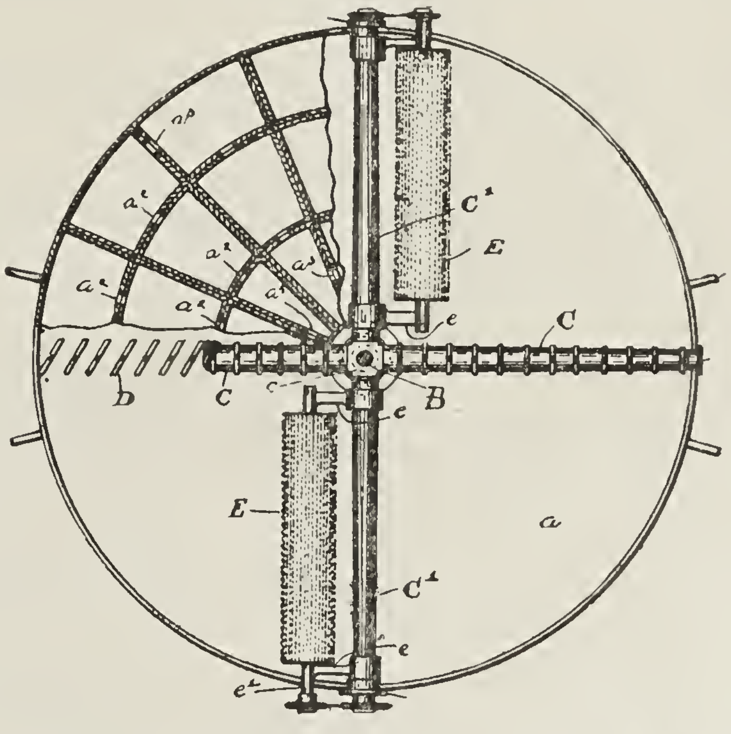
782,766. Mixer and Feeder for use in Brick-Making. Edward D. Steger, Bonham, Tex. Filed Mar. 9, 1904. Serial No. 197,252.

Claim.—1. A motar-mixer consisting of a casing, a plurality of troughs in the casing, arranged one above the other, each trough being adapted to deliver material into the trough below the same, spiral conveyors in the respective troughs for feeding the material therealong, the shafts of the conveyers projecting outside the casing, means outside the casing for rotatively supporting the shafts, a cylinder outside the casing, a feed device in said cylinder, a closed connection between the lowermost trough and the cylinder for securing the passage of material from the former to the latter, and steam-pipes having branches extending into the casing, and one of them being connected with said cylinder, said parts being combined substantially as described.



782,282. Drier. Peter L. Simpson, Chicago, Illinois assignor to Herbert S. Simpson. Filed April 18, 1904.

Claim.—1. In a device of the class described, the combination with a table adapted to be heated of a plurality of radial arms rotatively carried above said table, means adapted to rotate said arms, revoluble agitating means journaled longitudinally of said arms and a plurality of conveyer-blades adapted to move over the upper surface of said table.



In a device of the class described, a circular heating-table having a central aperture therethrough and adapted to be connected with a source of heat, an upwardly-extending peripheral flange thereon adapted to form a receptacle on the upper side of said table, a rotative shaft extending through said aperture, radial arms rigidly engaged thereon and adapted to track on said flange, a plurality of conveyer-blades on said arms adapted to engage material in said receptacle and move it toward the central aperture, a cylindric brush, means adapted to rotate said brush, a closed hood and means adapted to carry off the moisture from said hood.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,
Ninth Floor, Plymouth Building,
303 Dearborn Street,
CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.
Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVI. MARCH 15, 1905. No. 5

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

Don't jump at conclusions. "Feel them out" first.

Remember that in measuring success, "It's not the plan, it's the man."

A man of action doesn't dream of the morrow. He gets down to work the day before.

Don't be selfish. Tell your friends about THE CLAY RECORD. Let them enjoy it too.

The new administration was ushered in with favoring wind and weather, and it is hoped the term of President Roosevelt will be as bright and as free from cloud as the day which ushered it in.

Probably no other president ever received so nearly unanimous expression of good will from the people of every section as did President Roosevelt.

Somehow the people have unlimited confidence in him. They trust and believe in him. By them he is regarded as a man who is capable of doing and will do things. The imagination pictures what the future will bring if the people stand by and support him. But there is that little word *if*. There is an inherent weakness in them, an inclination to become weary and to relax their efforts in the direction of reforms, to fold their arms and allow things to drift.

It may as well at first as later be recognized that the "powers that be," the lawyers; the law-makers (or a majority at least); the corporations are united and their interests are opposed to those of the masses, and nothing short of a moral uprising of tremendous force can be expected to change the trend of affairs; and compel the interests or classes above outlined to acknowledge that the people are the masters and they must serve them, and not the selfish interests of the few as has been, and is now, the fact.

We do not often talk "shop," and in hope our readers will be patient with us while saying a word or two in "Advertising" notwithstanding there is nothing new to be said on the subject, that is; according to the opinions of some, there is nothing new to be said on the subject.

There are two sides to this business of advertising: the amusing and the serious sides. It is surprising how many there are, including men one would think knew better, who think there is nothing to be gained from advertising; and while they do a little of it, 'tis done because their neighbors do it; that anybody can write an "ad" say they; perhaps, yes, everyone can write one, but what manner of "ad" would it be when written? Among other amusing things are first the almost universal "kick" against advertising rates; again, the idea prevails that the tremendous profits (?) the publisher makes out of advertising are second only to the profits in the Standard Oil business.

We might enlighten such by a few facts but we must desist and take up the serious side of advertising.

Did you ever try to sell a piece of machinery for which you no longer had use but which was still of good value, and you felt sure there were those who if they knew your pleasure and the service the machine would have in it for them, you could dispose of it quickly, and it seemed impossible to find a buyer, but finally inserting an "ad" in a widely distributed daily or technical paper you soon secured a buyer?

Having had such an experience you are convinced of the serious side of advertising.

Again you have developed a new process of clay working; have had it patented, and built the first machine which starter up alright, did all you expected of it. You tell a few clay workers in your neighborhood and perhaps a machine is bought by each one, but still you have been at great expense and you must create a demand for the machine, but how? You advertised in the proper direction using the right medium and almost before you were aware of it, first inquiries, then orders came in, such an outcome being your experience you don't need to be told of the serious side of advertising; and what is more if ten dollars spent in advertising brought in one thousand dollars worth of business to you, it was at an expense of one per cent.; you are not asking to be told because you are already aware of the fact, that there is something real and earnest in this business of advertising.

Finally advertising has developed into so serious a matter that those who formerly were willing and sometimes anxious to trade off theater tickets, transportation, etc., for advertising space, feeling that as these things cost them little or nothing, they were willing to exchange because they regarded the advertisement also of no value. But now, no matter how they view their own wares, they regard the space for advertising wanted as having a value measured in the "coin of the realm," and handle the transaction precisely as they would if trading in houses or lands or any other tangible property.

It is almost an axiom, and as dependable as an "Aa" rating in "Bradstreet's" or "Dun's," the more successful and prosperous the concern the more extensive is its advertising lines.

Do you advertise? and are your lines as extensive as it would be profitable to you to have them?

Answering these questions honestly, please remember the "Clay Record" published semi-monthly is, by the successful men in the Clay Working Appliances, regarded as a dependable and sure means to bring results. Try it.

ACCIDENTS, DAMAGES AND LOSSES.

Chas. J. Richman has been appointed receiver for the Madison Brick Co., a corporation doing business at Shirley and Summitville, Ind.

J. Wells Farley has been appointed trustee for the Fiske Brick Co., Boston, Mass. The schedule filed with the court shows liabilities of $79,108; assets $11,710.

Celia Reilly, as administratrix, has her case on against the Troy (N. Y.) Brick Co. for $25,000 damages for the death of her husband, who was killed in the landslide last June.

Fred Van Inwagen, an official of the Tiffany Enameled Brick Co., of Momence, Ill., shot and killed himself while despondent. He was 45 years old and left a widow and six children.

The Sioux City (Ia.) Paving Brick Co. has been made defendant in a $10,000 suit for damages by Mrs. Spaulding for the death of her husband, who lost his life in a "cave in" at the clay bank.

Fifty pounds of dynamite exploded at the plant of the Colonial Pressed Brick Co. at Mogadore, Ohio, blowing the building in which it was stored to bits. The town was shaken. No one was injured.

A petition in bankruptcy has been filed against the Staten Island Brick & Tile Co., 132 Nassau street, New York, and Rossville, S. I., N. Y. Estimated liabilities, $22,000. The plant was destroyed by fire Feb. 21st with no insurance. It was formerly the Atlantic Brick Co.

The arch of a kiln at the Ostling Brick & Tile Co.'s plant on Western avenue, near Hopple street, Cincinnati, O., collapsed and August Schnabel, who was cleaning the arches, was buried in the debris. He was taken to the hospital, where it was found he was badly hurt.

HAUGH RE-ELECTED PRESIDENT.

At the annual meeting of the National Tile company, held in Anderson, Ind., B. O. Haugh of Anderson was re-elected president, George Lilly of this city vice-president and secretary, and A. D. Forst of Trenton, N. J., treasurer. The company operates encaustic tile factories in Anderson, Trenton and other points in New Jersey.

FIRE! FIRE!! FIRE!!!

A fire at the brick works of Gray Bros., State and Douglass street, San Francisco, Cal., caused a $15,000 loss. Friction of the machinery is believed to have started the blaze.

The Troy (N. Y.) Brick Co., located on Old Mill Hill, in the North End, was visited by a fire which practically destroyed the plant. It was one of the largest plants in the state. Gilbert P. Williams is the treasurer.

All the frame buildings of the Athens (Ohio) Brick Co. were destroyed by fire, causing a $15,000 loss. Insurance on property, $9,000. The machinery was badly damaged, so as to be useless. The principal stockholders are Dr. W. N. Alderman, Henry O'Bleness, Fred Stalder and C. H. Doan.

LEADING CONTRACTORS SIGN AGREEMENT NOT TO USE PRISON-MADE BRICK.

All the leading contractors of Walla Walla, Wash., and the Bricklayers' union have signed an agreement not to use the penitentiary brick.

Contractors say that work has been delayed every spring for several years by the failure of the penitentiary officials to furnish the brick demanded, and that bricklayers object to prison-made brick. A home brickyard with free labor is favored.

Weston is now the chief source of supply for brick.

An agreement has been forwarded to Senator Pauly, chairman of the committee on penal and reformatory institutions, that he may give the legislature an opportunity to provide other employment for the convicts. Warden Kees says the closing of the brickyard would throw out of employment 250 convicts. He has now on hand 7,000 tons of clay and has many orders for brick that he cannot fill.

FIVE-ACRE TRACT IS FREE FOR MANUFACTURING PURPOSES.

As an inducement to the development of the clay industry and the utilization of commercial clays and shales, James F. Lankford, of Martz, Ind., will contribute a five-acre tract of tested land, on which to establish a plant of up-to-date equipment and capacity for the manufacture of clay products, surrounding and adjacent to which larger tracts may be leased. This proposed site lies within two miles of Clay City, and but three-fourths of a mile from the 'Frisco railway. Within thirty-five feet of the surface there is fourteen feet of high-grade refractory clay, suitable for stoneware, hollow brick, flue lining and similar utilities; chemical analysis, made at the instance of State Geologist Blatchley, showing a base of 95 per cent clay and sand, with a very low percentage of fluxes, and also five feet three inches of coal in two strata underlying the fireclay. At the depth of 100 feet is another stratum of clay underlaid with coal.

The specimens of clays shipped from this field to Chicago have been pronounced equal in quality to any for general manufactures, and superior to all others in the production of encaustic tiling. The future of this field in this line of industry and production will be assured when once the output of utilities shall have found their way into the commercial marts of the country.

BIG BOOM IN BRICK IN VICINITY OF PORTSMOUTH.

As the spring opens there will be hustling among the brick plants in the vicinity of Portsmouth, O., as the coming season promises to be an unusually busy one in this line.

The Clare Plant.

The Clare plant, to be constructed near Eifort Station, will soon be ready for action. The stock is about all sold and the work of erection will soon begin, and when completed will manufacture paving brick.

South Webster Plant.

The new plant to be erected at South Webster will be large and modern. The plans are being made and its erection will follow as soon as possible. This plant will manufacture fine building brick. The building brick made from the material in this locality have already become famous.

The Carlyle Plant.

The contract will soon be let for the erection of this plant. It will be erected immediately west of the Scioto Star Yards, and will manufacture fire brick. This plant will be up-to-date, modern in every particular and will be one of the best plants in the county when completed.

Fire Brick Plant.

The plant at Fire Brick, Ky., will cease the manufacture of fire brick and will remodel and arrange their plant for the manufacture of building and paving brick. The material of this locality being especially adapted to the manufacture of building and paving brick.

The Tygart Plant.

The Tygart, Kentucky, plant will continue the manufacture of fire brick, and will build an additional plant for the making of paving brick. This company have built a railroad running back into the Schultz mountains, where they tap one of the largest and best clay fields in this locality. This road will be equipped with modern rolling stock for the transportation of this material. This company have a large fire brick plant in Cincinnati, and the clay and other material for this plant will be mined at the Tygart plant and shipped to Cincinnati.

Peebles Plant.

The Peebles plant will be called on to furnish an immense quantity of brick for the paving of streets in Ashland and its season will be the busiest in its history by far.

Other Plants.

The other plants of this locality will be run to their full capacity and the output of brick of various kinds will be greater this season than ever reached before. The Portsmouth brick have come to the front in the market and like the Portsmouth shoe, finds a ready sale.

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A LABORATORY ADDED TO THEIR PLANT.

The Laclede Fire Brick Co., of St. Louis, Mo., has just installed in its plant a complete laboratory, which is in charge of A. J. Aubrey, a graduate of the Ohio State University, of Columbus. This company manufactures fire brick, cupola blocks, tiles, sewer and culvert pipe, etc., and analyzes all the raw materials entering into the manufacture of its products.

BREWER'S FORTY-SIXTH ANNUAL CATALOGUE.

The forty-sixth annual catalogue of H. Brewer & Company, Tecumseh, Mich., is now being distributed. Each year this concern outdoes the former year in getting up literature for the trade. The firm was established way back in 1849, incorporated in 1900 and have always done a splendid business. It has been customary for many years for them to thoroughly revise their catalogue yearly.

On page five of the catalogue is a diagram showing the different kinds of ware made by the different machines, and some other very valuable information to a brick or tile maker.

Brick and tile dies, machines and cutters are illustrated for almost any size plant. Crushers, pug mills, elevators, winding drums, clay cars, wheelbarrows and carts are all shown.

If you are interested H. Brewer & Company will send you a catalogue. Ask for it.

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SAVAGE COMPANY AT FAIRCHANCE BUY THE DELANEY PLANT.

It is announced at Uniontown, Pa., that the Savage Hill Fire Brick company of Fairchance has purchased the plant and property of the Delaney Fire Brick company at Fairchance, of which McClelland Leonard of Uniontown is the principal owner. The Savage Hill company manufactures a high grade fire and silica brick, and proposes to change the product of the Delaney plant to similar high grade material, having large quantities of raw material for that purpose.

In addition to the present stockholders, the organization includes J. M. McKinley, formerly with the Harbison-Walker Refractories company of Pittsburg, and McClellan Leonard of the Delaney company. Harry Wyhel of Uniontown is president, George B. Burchinal of Uniontown is secretary and treasurer, J. M. McKinley general manager; other members of the company are as follows:

George Wyhel, Uniontown; William Taylor, Masontown, and Alexander Fleming, Scottdale. Both plants will be operated continuously, as orders have been booked for considerable amounts of coke oven material. The Fairhope works have been run constantly for four years, and the output has not been sufficient to meet all of its trade, so that the addition of the Fairchance works has been found necessary in order to meet increasing business of the Savage Hill company.

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LOWEST RATES EAST

are afforded via the Nickel Plate Road. With solid through trains to New York City and intermediate points, via both Lackawanna and West Shore Roads, and to Boston and other New England points, via the Nickel Plate and West Shore and Boston & Maine Roads, travelers via that popular low rate line are offered all modern conveniences. Excellent dining car service, meals being served in Nickel Plate dining cars on American Club Meal Plan, ranging in price from 35c to $1.00. No excess fare charged on any train on the Nickel Plate Road. Chicago depot, Van Buren and La Salle Sts., the only railroad station in Chicago on the Elevated Railroad Loop. City Ticket Office, 111 Adams St. 'Phone Central 2057.

THE NEW YORK BLOWER CO.'S NEW CATALOGUE.

The NEW YORK BLOWER COMPANY have issued a new sectional catalogue No. 55 on Heating and Ventilation. It contains a full description of the different styles of their new heater, shows some of their different styles of Hot Blast Apparatus and then several applications of their heating and ventilating system.

The catalogue may be had for the asking by writing to their office at 25th Place and Stewart Avenue, Chicago.

WILL BUILD A BRICK AND SEWER PIPE PLANT.

The Toledo Coal & Clay Company, Spitzer Bldg., Toledo, O., has increased its capital stock from $350,000 to $500,000. One-half of the total stock, or $250,000, is to be six per cent preferred.

The company owns outright 2,000 acres of coal lands at Bird's Run, Guernsey county, O., and has been operating a coal mine since September, 1903, with a daily output of 15 cars.

The increase in the capitalization is made to provide for a number of big improvements which are in contemplation. When the company secured the property they intended to operate a coal mine only, but having discovered rich deposits of shale and fireclay, which had to be extracted in order to remove the coal, they decided to erect a brick and sewer pipe plant to take care of the by-product. The brick plant will have a capacity of 30,000 per day, with sewer pipe in proportion, and work on the erection of the building will be commenced in the spring.

PLANS FOR THE CARLYLE PLANT READY.

With the exception of the steam plant all of the machinery for the new Carlyle brick works, Portsmouth, O., which are to be erected near the Star yards, has been contracted for. The contracts went to a number of out-of-town firms.

The plans for the new concern call for a daily capacity of 60,000 brick. The works will be located on the south side of the railroad tracks overlooking the river, so as to give the advantage of steamboat shipping. A big steel viaduct will be constructed over the railroad tracks and leading to the shale bank in the hills north of the Gallia pike. Just what will be located on the various pieces of ground bought north of the tracks is not yet decided, but in all likelihood these will be utilized for yards and also for houses for employes. Work on the new plant will be commenced as soon as the weather permits.

ROSS-KELLER PUTTING IN SAND-LIME BRICK PLANTS.

The Ross-Keller Triple Pressure Brick Machine Co. is now erecting a large sand-lime brick plant for the Sharp Sand Brick Co., of Columbus, Ohio. The plant is located at Sugar Grove, Ohio, and is being equipped with a full line of the Ross-Keller Sand-Lime Machinery, including two of their celebrated four-mould Triple Pressure Presses. The machinery is on the grounds and the factory will be in running order within the next sixty days.

A BIG KAOLIN DEAL.

Mr. J. C. Melcher, of O'Quinn, Tex., has closed a deal with Mr. Chas. Efros (trustee), of Lakewood, N. J., for all the kaolin, china clays and lignite coal on the H. Leitenberg 1,000-acre tract, on the S. A. & A. P. R. R., near West Point, Tex. The china clay was found to be 20 ft. thick in places, with only 10 inches of stripping. Mr. Melcher still owns all his individual high-grade fire, tile and paving clays, and is soliciting capital to start a modern brick and tile plant. He has clay, coal and wood enough to last a lifetime.

Texas is coming to the front with clays, lignite, oil, gas, iron and many other things.

POTTERY NEWS ITEMS.

The capital stock of the Sevres China Co., East Liverpool, O., has been increased from $100,000 to $250,000. The plant will be enlarged.

The Knoxville (Tenn.) Pottery Co. are busy with the erection of its plant at Oakwood, and before many days it will turn out jugs, etc.

The Ajax Brick & Tile Co., Colorado Springs, Colo., has found shale that will make flower pots and has commenced the manufacture of them.

The famous Edgerton Pottery is now located at Rockford, Ill. The first goods will be placed on the market in April. A. W. Wheelock is the manager.

Knecht Bros. are having a large brick and pottery plant erected on Benson avenue, near St. Agnes Hospital, Baltimore, Md. The plant will cost $25,000.

The stockholders of the A. Radford Pottery Co., Clarksburg, W. Va., have voted to increase the capital stock from $50,000 to $100,000. This was done in order to enlarge the plant.

The Fairfield Pot & Clay Co., Lancaster, Ohio, has been incorporated with $25,000 capital stock, by Addison Thompson, L. B. Martin, C. H. Mitchell, John E. Allen and Thos. C. Fulton.

The Old Chelsea Pottery, Cumberland, W. Va., will henceforth be called the Standard Porcelain Works. Mr. Dyke, the manager, has started on rebuilding it, and in a short time ware will be turned out.

The J. W. McCoy Pottery Co., Roseville, Ohio, has been incorporated with $125,000 capital stock, by James W. McCoy, F. M. Rider, G. W. Walker, W. R. Baker, Geo. H. Stewart and C. Stolzenbach.

The Novelty Pottery Co., Oakland, Cal., has filed articles of incorporation with $25,000 capital stock, by Frank H. Horswill, Thomas W. Cook, A. E. Williams, J. S. Corrigan, A. L. Kreiss and J. A. Kirk.

The directors of the New Lexington (O.) High Voltage Porcelain Co. have held a meeting and reorganized, and will again commence the manufacture of goods. C. Lowry has been employed as superintendent.

The New Castle (Pa.) Pottery Co.'s plant and assets have been sold by Trustee J. H. Preston to local men, who will pay all debts and operate the plant. They are David Jameson, Charles H. Johnson and Alexander Hoyt.

SAND OR LIME-BRICK OR BLOCK NEWS.

J. B. Cordero, of Jacksonville, Fla., is trying to organize a sand-lime brick plant at Waycross, Ga.

Genesee, Pa., is to have another sand-lime brick plant. The location, sand, etc., has been secured.

Maxfield Bros. have located a cement block factory at the C. L. & N. R. R. sand pit, at Camp Hagerman, O.

Frank H. Powers, 24 Nevada block, San Francisco, Cal., is organizing a company to make sand-lime brick at Carmel.

The Bond Sandstone Brick Co., Lake Helen, Fla., have added much new machinery to their plant, doubling its capacity.

The Pettijohn Company, Terre Haute, Ind., has been organized to make hollow concrete blocks. Capital stock, $10,000.

The Bonita Brick Co., Meridian, Miss., which is now operating a clay brick plant, contemplate a sand-lime brick plant that will cost $30,000.

C. A. Rotzean and Charles Felton, Michigan City, Ind., have formed a partnership and will build a sand-cement brick plant, using their own process.

Vrooman Bros., Anoka, Minn., are to start a cement-brick factory. A sand-cement brick machine having 15,000 brick daily capacity has been ordered.

The Western Brick Co., of Keokuk, Iowa, have "on tap" the starting of a sand-cement brick plant at Eldon, Iowa, provided the citizens can be interested.

Edward I. Frost, secretary of the Chamber of Commerce, Salisbury, N. C., can give information about a sand-lime brick plant that is proposed for that city.

The Peerless Building Block Machinery Co., Milwaukee, Wis., has been incorporated with $10,000 capital stock. Incorporators: Geo. H. Gabel, Edwin Henes and A. R. Kline.

The Paragon Plaster Co., Syracuse, N. Y., will double the capacity of their sand-lime brick plant, and make 30,000 brick daily. William K. Squier is the president of the company.

The Artificial Stone Co., Jackson, Mich., has been incorporated to make concrete blocks. The stockholders are W. T. Smith, A. M. Haight, Perry Merrill and W. Miller. The capital is $5,000.

Chief of Police Sipp, Hamilton, Ohio, and M. Carl, are working on the forming of a $30,000 stock company, to build a sand-lime brick plant on his farm, where splendid sand and transportation facilities can be had.

Capt. Lawrence Comerford, of Little Rock, Ark., manager of the Granite Brick Co. and of the Missouri Granite Brick Co., is making arrangements to start another plant at Pine Bluff, Ark. Several Pine Bluff men are also interested in the Little Rock plant.

The Laketon (Ind.) Sand Brick Co. has been incorporated, with $50,000 capital stock, by Wabash, North Manchester and Laketon parties. The stockholders are N. G. Hunter, B. S. Dunn, T. Gushard, W. R. Oyler, G. L. Shoemaker, W. T. Fleek, J. C. Richer, K. B. Dunn, J. E. Harter and Michael Geik.

MISCELLANEOUS ITEMS.

Ruben Fenstermaker, Ellsworth, Ill., of Fenstermaker Bros., has sold his interest to his brother, Frank Fenstermaker.

The Diamond Brick Co. of Oak Hill, O., has increased its capital stock from $20,000 to $40,000. E. E. Hughes is the president.

Albert A. Gery, president of the U. S. Brick Co., Reading, Pa., is now in Cuba and will start a brick plant there if suitable clay is found.

J. M. Hartley, Washington, Ill., is being urged by his friends to form a stock company and go into the business on a more extensive scale.

The Toledo (O.) Coal & Clay Co., Spitzer Bldg., has increased its capital stock to $500,000, and will build a brick and sewerpipe works at Birds Run, O.

F. A. Griffin and Eastern capitalists have bought in the Griffin (Ill.) Brick & Tile Works and will overhaul the machinery and put the plant into operation.

Eastern and Northern capitalists will erect a plant near Decatur, Ala., for the manufacture of fire brick and fire clay products. The plant will cost $100,000.

The South Webster (Ohio) Brick Co. has been incorporated with $20,000 capital stock. The incorporators are: Wilbur Stoat, H. M. Strong, F. W. Schaeffer, H. L. Harper and W. E. M. Ranchous.

J. A. Wilson of Wilson Bros., Dows, Ia., has bought the brick and tile works at Livermore and will operate it in connection with the one they are now running. The capacity of the plant will be doubled.

The Ash Fire Brick Co., Detroit, Mich., has been incorporated with $40,000 capital stock by Theo. L. Smith, Sinclair Harcus, George Skelton, Chas. F. Hunt and Wm. H. Perkins of Detroit and Charles R. Berry of Howlett.

The Clermont Brick Co., Cincinnati, O., has been incorporated with $25,000 capital stock by Harlan Cleveland, H. T. Loomis, Virginia Platt, John W. Devanney and W. R. Probosco. This company has bought the Batavia Brick Works.

The Aregood Brick Co., Chicago, Ill., has bought a tract of land on the west shore of Lake Calumet and will build a plant that will make 80,000,000 brick annually. The cost will be $124,000 and the capital stock of the company is $500,000. John W. Aregood will be the manager.

The Empire Pressed Brick Co. at Spokane, Wash., will build a pressed brick plant at Trent. The capital stock is $100,000. The directors are: Ralph K. Green, David K. Bissell and Samuel G. Borgman of Spokane; Geo. E. Watson of St. Louis, Mo., and Chas. N. Munger, Rochester, N. Y.

The Springwells Brick Co., Detroit, Mich., has been incorporated with $85,000 capital stock. Among the stockholders are Henry C. Potter, Jr., Henry P. Borgman, Bryant Walker and Frank E. Robson. This is a reorganization of the Hall Brick Co. which recently went into the hands of a receiver.

Owen & Long will build a brick plant at Jackson, Tenn. Chas. Owen is the engineer.

Calvert & Leek, Ogden, Utah, have received a quantity of machinery from the east to install in their new brick plant.

The Hocking Clay Mfg. Co., of Logan, Ohio, has reduced its capital stock from $100,000 to $75,000, and the Logan Clay Products Co. succeeds it.

The Maben (Miss.) Brick Co. is establishing a plant for the manufacture of brick with a daily capacity of 50,000 brick. The authorized capital stock is $30,000.

Washburn Bros. Co., of Glasco, N. Y., are installing the Martin System of Steam Dryers to take care of 150,000 brick a day. The Martin brick machines are also being put in.

Lexington (Ky.) Brick Co. are at the present time erecting a brick dryer under the direction of one of the experts of the Henry Martin Brick Machine Mfg. Co. of Lancaster, Pa.

Geo. W. Songer of Hoopeston, Ill., has organized a company at Rosenberg, Texas, for the manufacture of brick and tile. Mr. Songer is well and favorably known in the clay trade.

Per Johanson has found a deposit of fine clay on his land near Nora, Idaho, and has bought a brick machine outfit from W. G. Lauder of Moscow, and will put same in operation.

The Albert Lea (Minn.) Brick & Tile Co. has been incorporated with $100,000 capital stock. The incorporators are M. F. and A. F. Rusfeldt, W. A. Morin, John H. Griffin and H. C. Carlson.

The Crescent Brick Co., Red Bank, N. J., has been incorporated with $75,000 capital stock. Incorporators are D. H. Applegate, D. H. Applegate, Jr., and Howard S. Higginson, all of Red Bank.

The Abernethy Brick Co. are preparing to install a new plant at Bridgeport, N. C. They have placed their order for the machinery with the Henry Martin Brick Machine Mfg. Co., Lancaster, Pa.

The Lakeview Brick Co.'s new plant at Lorain, Ohio, will be started in full operation within the next few days. The Martin machine and dryers are completed and only some minor points need attention.

The Globe Real Estate Co., Scranton, Pa., which some time ago acquired control of the McCormick Brick Works at Pittston, has the plant ready for operation. A new steam dryer and much new machinery has been added. R. D. Landon is the general manager.

The Ross-Keller Triple Pressure Brick Machine Co. have just shipped a four-mould triple pressure press, together with other machinery making up a complete equipment, to the Ada Pressed Brick & Tile Co., of Ada, I. T., and work of installation will be begun immediately.

A new brick company has been formed in the eastern part of New York, and will start with a capacity of 300,000 brick a day. They have bought their entire equipment, comprising eight machines with pugmills and attachments, at Lancaster, Pa., from the Martin Machine Mfg. Co.

The plant of the Ohio Sewer Pipe Co., at Empire, has been sold to the Stratton Fire Clay Co. of the same place.

It is reported that the Allentown (Pa.) Paving Brick Co.'s plant has been sold to the United States Brick Co. of Reading.

The Danville (Ind.) Brick Co. has been incorporated with $20,000 capital stock, by Evan B. Davis, Jas. E. Hunston and Wm. F. Franklin.

J. A. Haynes of Muskogee, I. T., is considering the putting in of a brick-making plant at Bartlesville, provided he can secure a good location.

George H. Henderson and Charles E. Paul, Virginia, Ill., have formed a partnership to handle the business formerly conducted by Mr. Henderson.

The Clay City (Ky.) Brick Co. has been organized with $75,000 capital stock. S. E. and Mathew Lenkard of Reynoldsville, Pa., are the promoters.

The Empire Brick Co., Chicago, has been incorporated with $2,500 capital stock, by Henry Busse, Fred A. LaBahn Louis Reimer and B. F. Weber.

J. G. Watson, Calgary, Alberta, Canada, has bought machinery for making pressed brick and will install a first-class plant there soon as the machinery arrives.

Norwood R. Shields of Greenwich, Ct., has leased for five years the Spencer (N. Y.) Brick Works and will operate same with Geo. W. Cook of East Ithaca as a partner.

The Superior Brick Co., Lima, Ohio, has been incorporated with $25,000 capital stock, by C. H. Corry, O. H. Odell, J. L. Tannehill, E. G. Dempster and J. C. Tannehill.

The Annandale (Minn.) Brick & Tile company has been formed with $10,000 capital, by A. M. Ridgway, L. R. Williams, W. D. McDonald, John H. Burt and C. F. Zimmerman.

Steelton (not a P. O.), the manufacturing town north of New Martinsville, W. Va., is to have a brick-making plant. J. C. Janson and James Holgrove are said to be among the promoters.

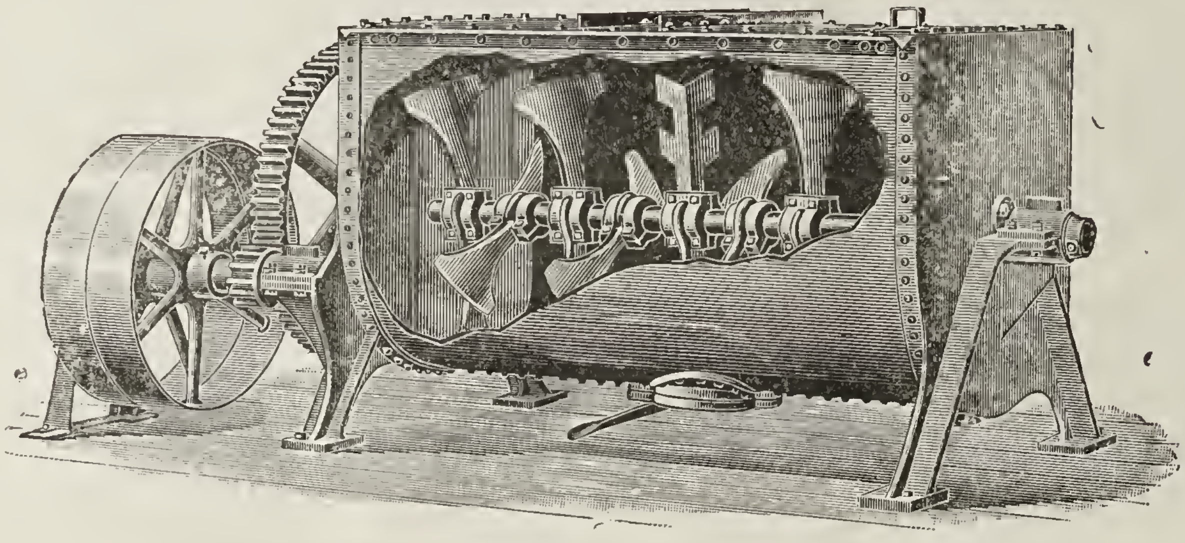
The Cache (Okla.) Brick, Tile & Investment Co. has been incorporated with $100,000 capital stock, by E. S. Simmons, B. O. Banks, P. M. Teter, Charles Jarvis and C. M. Clingan, all of Cache.

The capacity of the Pittsburg, Kan., brick yard of the Alphons Custodis Chimney Construction Co. is being trippled. Frank B. Stafford is consulting mechanical engineer for the work.

The Hayes Brick Co., Los Angeles, Cal., has been organized with $50,000 capital stock. Directors are H. L. Hayes, J. D. Ryan, Joseph Messner, L. Snodgrass and John T. Jones, of Los Angeles.

F. D. Read, the manager of the Read Brick works at Petersburg, Minn., has bought in the brick yard at Princeton and will shortly leave for there. Thomas Read will operate the plant at Petersburg.

The Bonner & Marshall company, Chamber of Commerce, Chicago, has been incorporated with $25,000 capital stock, to sell clay products and road materials. Charles Bonner and Sylvester Marshall are the principle stockholders.



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OPPORTUNITY, care Clay Record.

BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

FOR SALE.

Good Brick and Tile Factory. Good clay, good railroad facilities, and good field especially for tile.

B. P. C., care Care Clay Record, Chicago.

FOR SALE.

White Glass Sand or Sand Brick Property, near St. Louis, Mo.. Situated on two roads. All facilities. Switches on property. Address

M. S. G.,
Care Clay Record, Chicago, Ill.

FOR SALE.

Brick and tile plant. Stiff Mud. Continuous kilns. Steam dryer. Good clay and excellent market.

D. W. TOWNSEND,
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20,000 fine pallets. $30 00 per thousand, F. O. B. cars here.

JOHN BUCKLEY,
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NEW AND SECOND-HAND MACHINERY FOF SALE.

One No. 6 Machine, capacity 50 to 75 thousand brick per day.
Three "Eli Jr" Brick and Tile Machines.
One "Little Eli" Brick and Tile Machine.
One No. 1-A Brick and Tile Machine, with square hopper.
One No. 1 Brick and Tile Machine, with upright pug mill, second-hand.
Two No. 2-B Brick and Tile Machines, with square hopper.
Two No. 5 Disintegrators, capacity 40 to 60 thousand per day
Two No. 1 Disintegrators, capacity 25 to 35 thousand per day.
Three Winding Drums or Hoists.
One "D" Freese Tile Machine, second-hand.
One 30 h. p. Engine.

Above machinery is same as new and will be sold cheap. It is guaranteed to be as represented in circulars mailed on request.

JAMES F. CLARK,
Morenci, Mich.

Machinery For Sale.

FOR SALE.

50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets. Track gauge 25 inches.
Both styles of cars in first-class repair.

ATLAS CAR & MFG. CO.
Cleveland, Ohio

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine. Address "GIANT,"
Care Clay Record, Chicago.

FOR SALE.

1 Raymond Victor double die steam repress.
1 Raymond Columbian double die steam repress.
1 American Clay Working Machinery Co. Eagle double die steam repress.
3 Bonnot double die steam represses.
2 Penfield single die steam represses.
1 four-mold Boyd Dry Press, new.
All in thorough repair.

Address E. C.,
Care Clay Record.

FOR SALE—CHEAP—1200 Steel Crimped Pallets. 10x34 inches. Address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

MACHINERY FOR SALE.

$200.00 buys a Freese Combined Brick and Tile Machine and Pug Mill. Dies, Tables, complete, No. I. Good order.

Address OHIO,
Care Clay Record, Chicago.

FOR SALE—CHEAP—New and re-laying rails. 12, 16, 20 and 25 pound. For prices, address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE.

Four-Mold Dry Press, absolutely as good as new. made only one kiln of brick. Can sell for less than half original price. Address

"DEALER," care Clay Record.

FOR SALE.

For sale at a bargain, a J. D. Fate Company Stiff Mud Brick Machine, with Bensing Automatic Cutting Table, practically as good as new, Capacity, 5,000 per hour.

THE VULCAN CLAY CO.,
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TO EXCHANGE.

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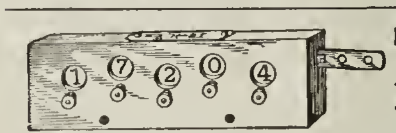

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Sold by all dealers
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FOR SALE—Swift's **Wonder of the Age,** Grateless Furnace Kilns. Cost of construction less than one-half. Write for particulars.

F. E. SWIFT.
420 W. 4th St., Dayton, Ohio

FOR SALE—KILN PLANS.

"We have *shattered* our previous records. Time of drying 21 hours; time of burning 12 hours."

C. A. NELSON, West Manchester, O.
STEWART PATENT KILN CO.,
Findlay, Ohio

FOR SALE.

Drain Tile and Brick Plant for sale Good machinery. Good location. Plenty of clay. Price $2300, small payment down, long time on rest. Will take product as pay. Address

CONTINENTAL,
Care Clay Record, Chicago.

FOR SALE.

One No. 4 Double Mold Brick Repress, made by The American Clay Working Machinery Co. Price $125.00.

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A 4-Mold Dry Press Brick Machine and a complete wire cut brick outfit. Also Boilers and Engines of all sizes, at a bargain.

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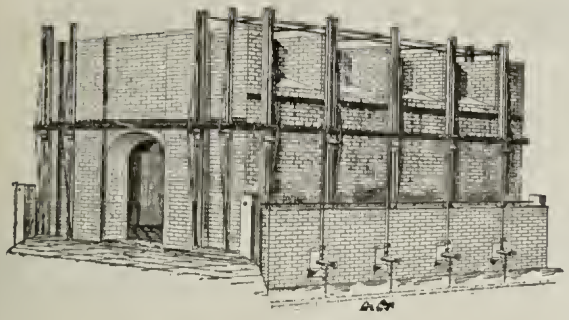

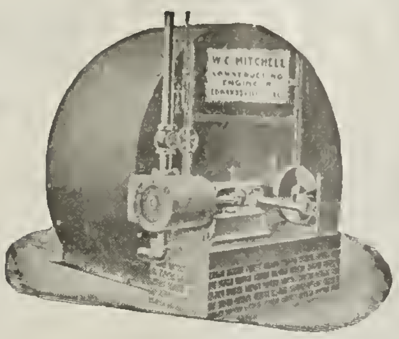

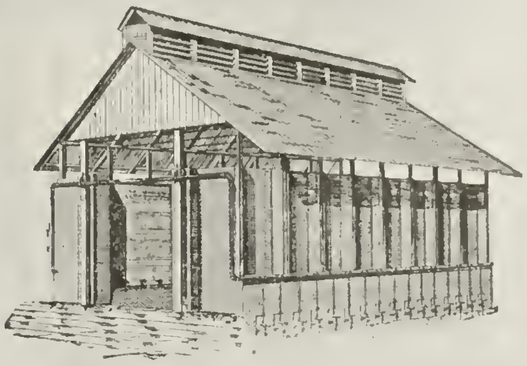

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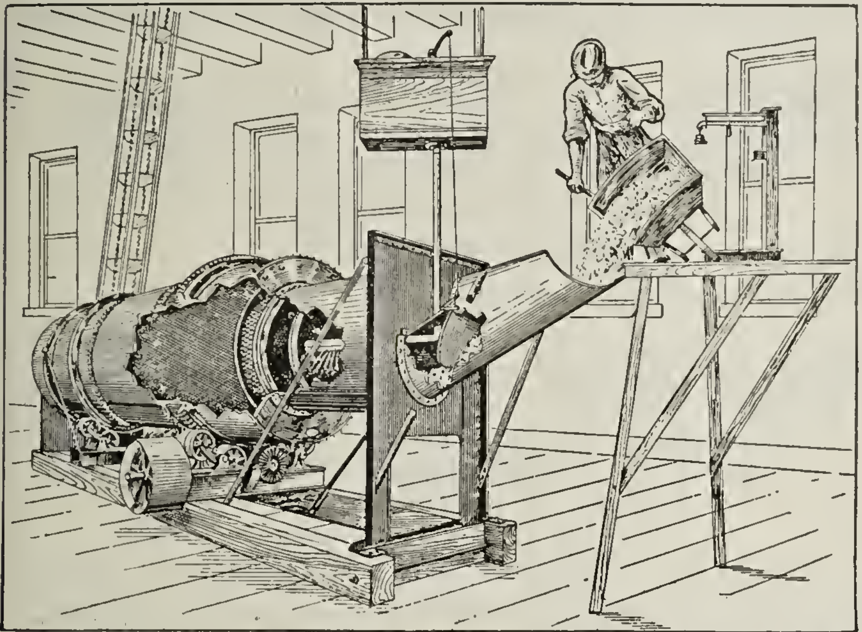

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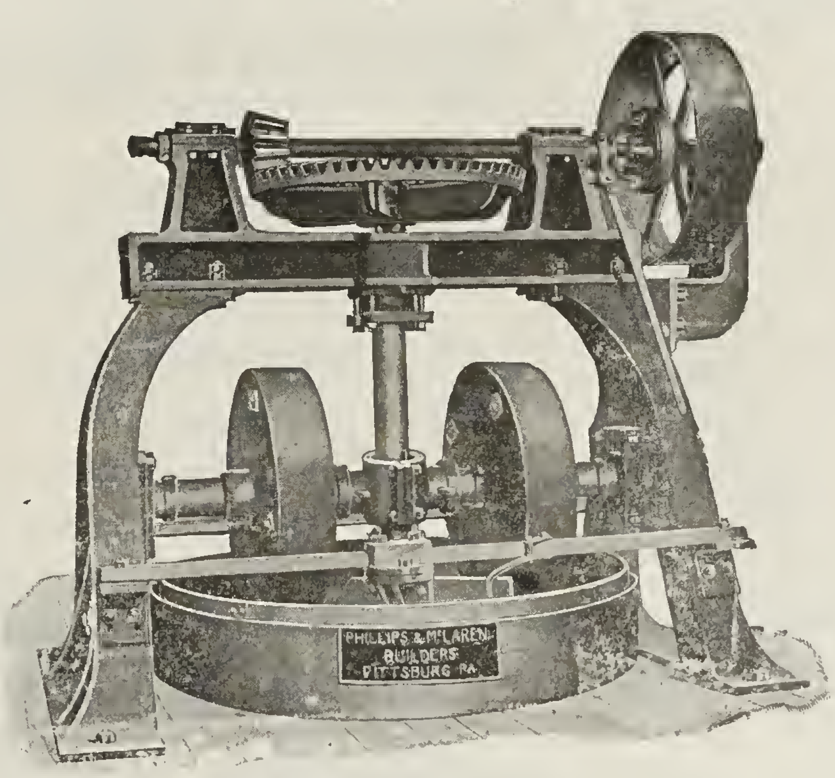

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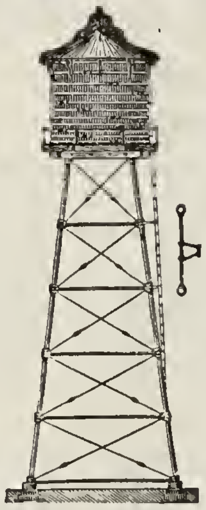

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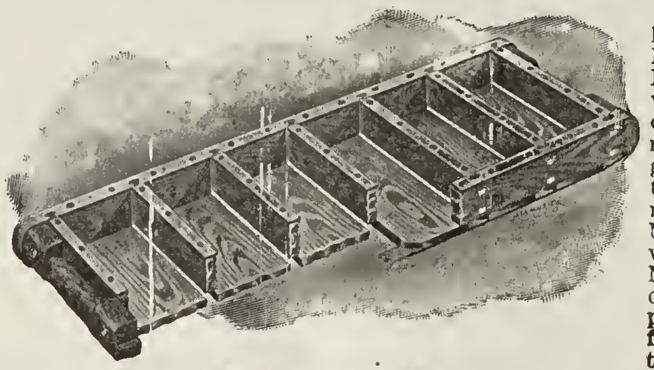

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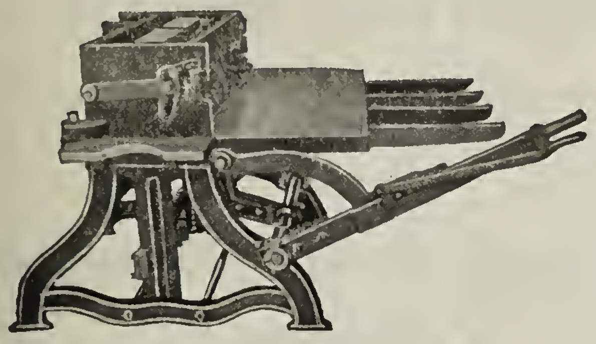

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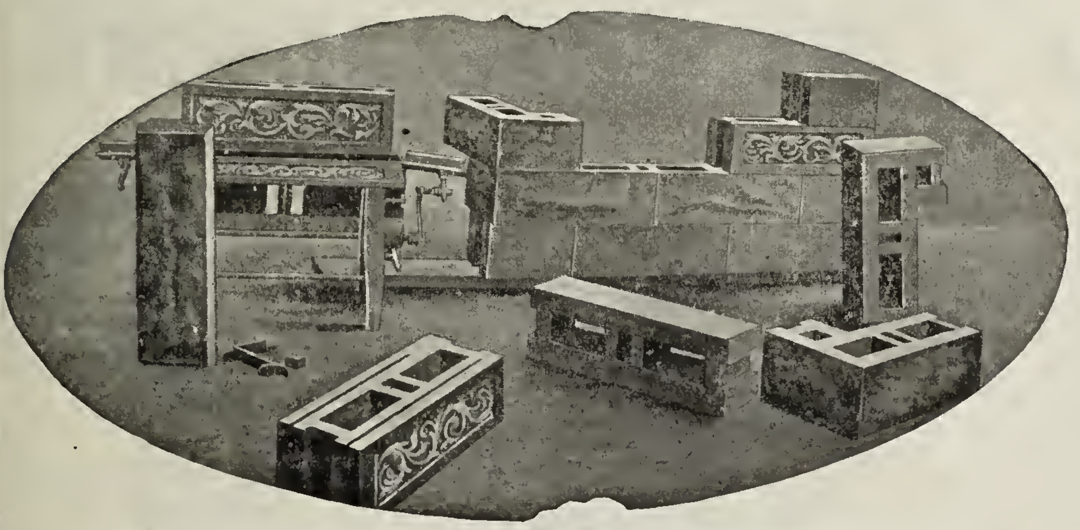

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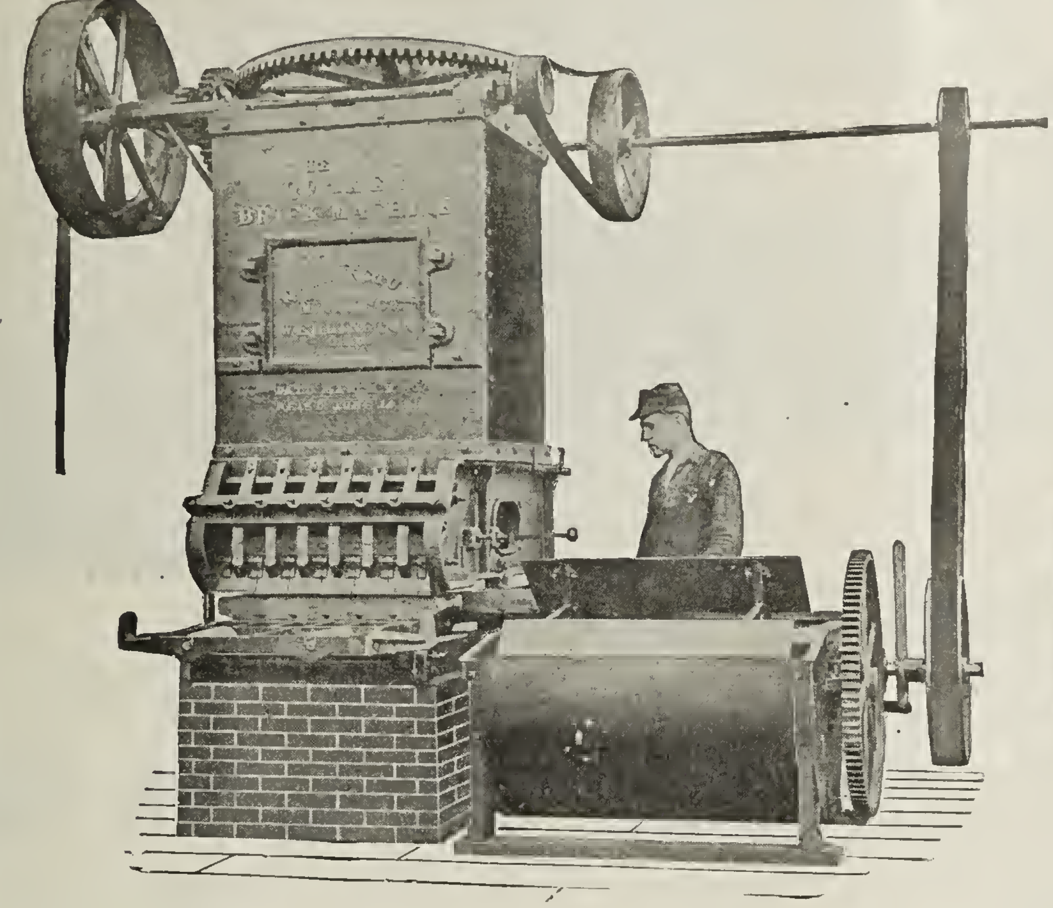

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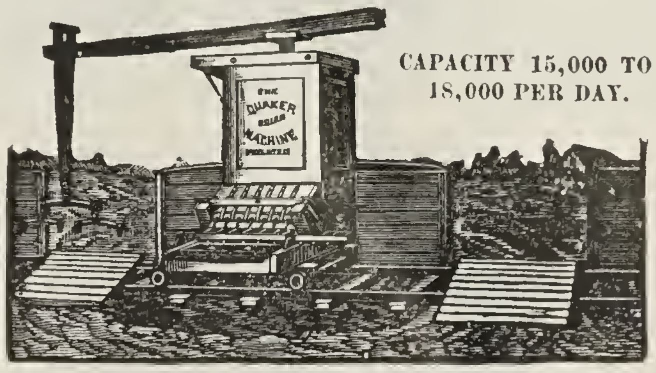

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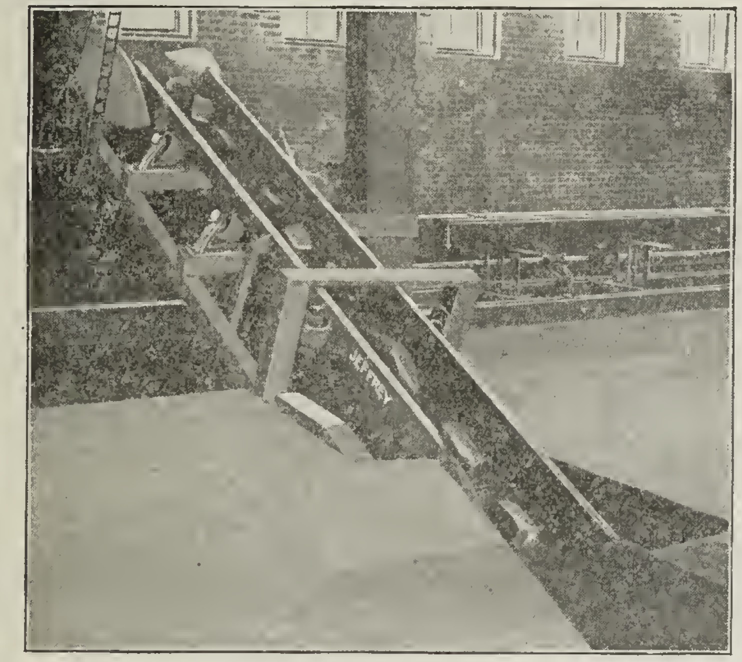

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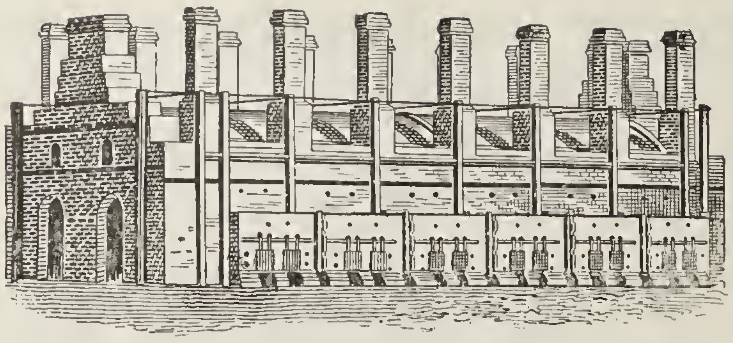

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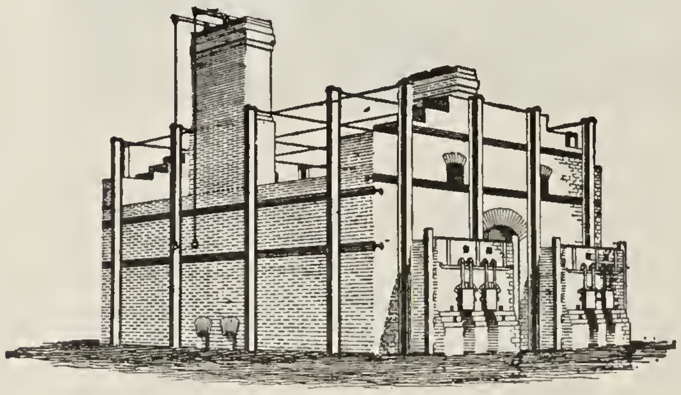

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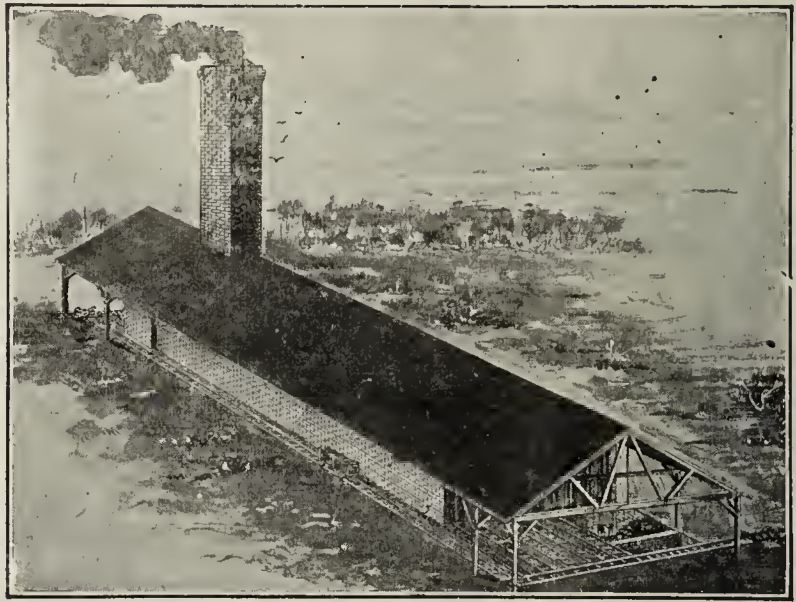

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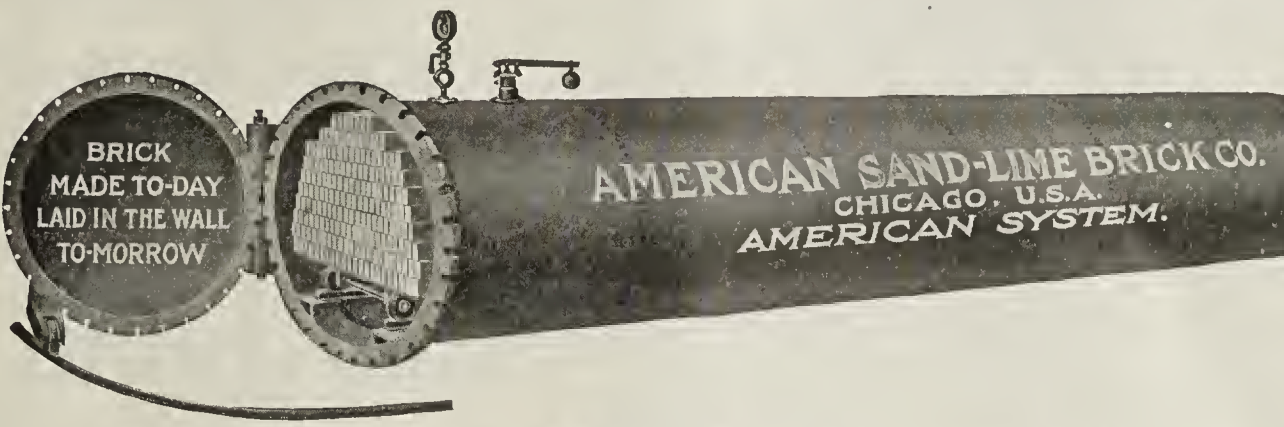

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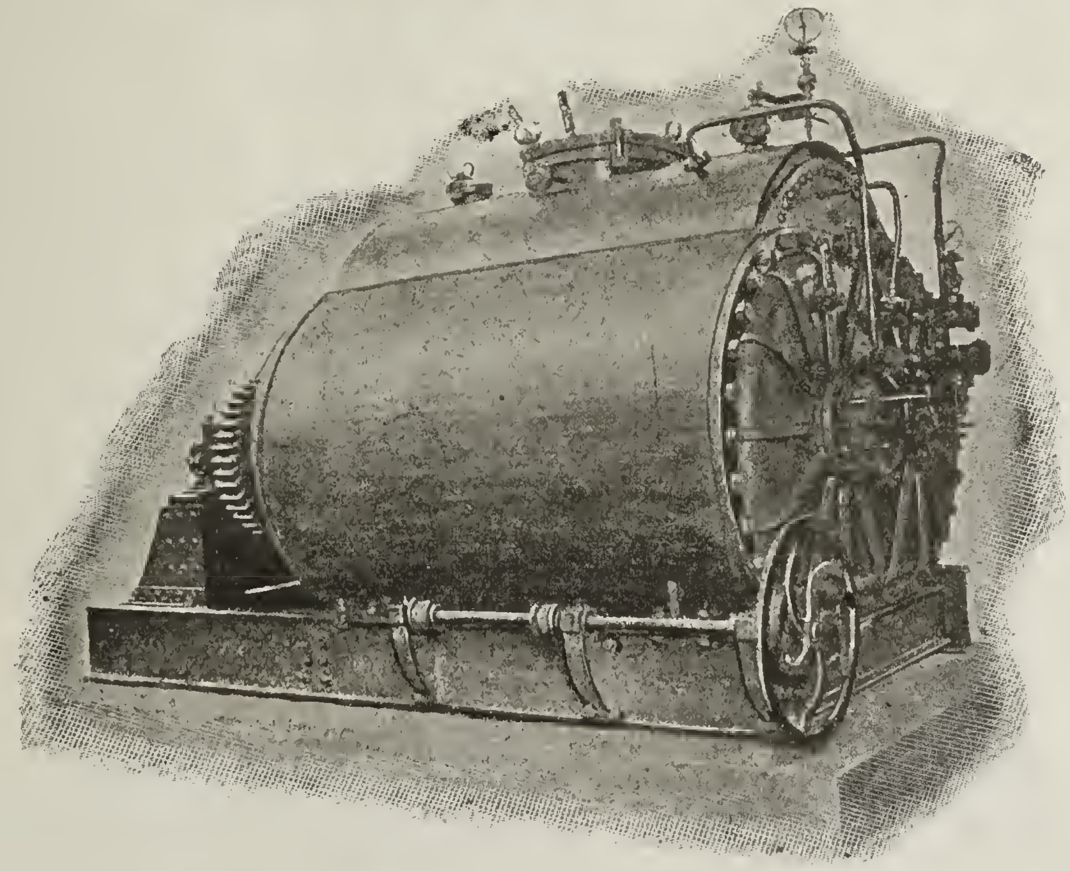

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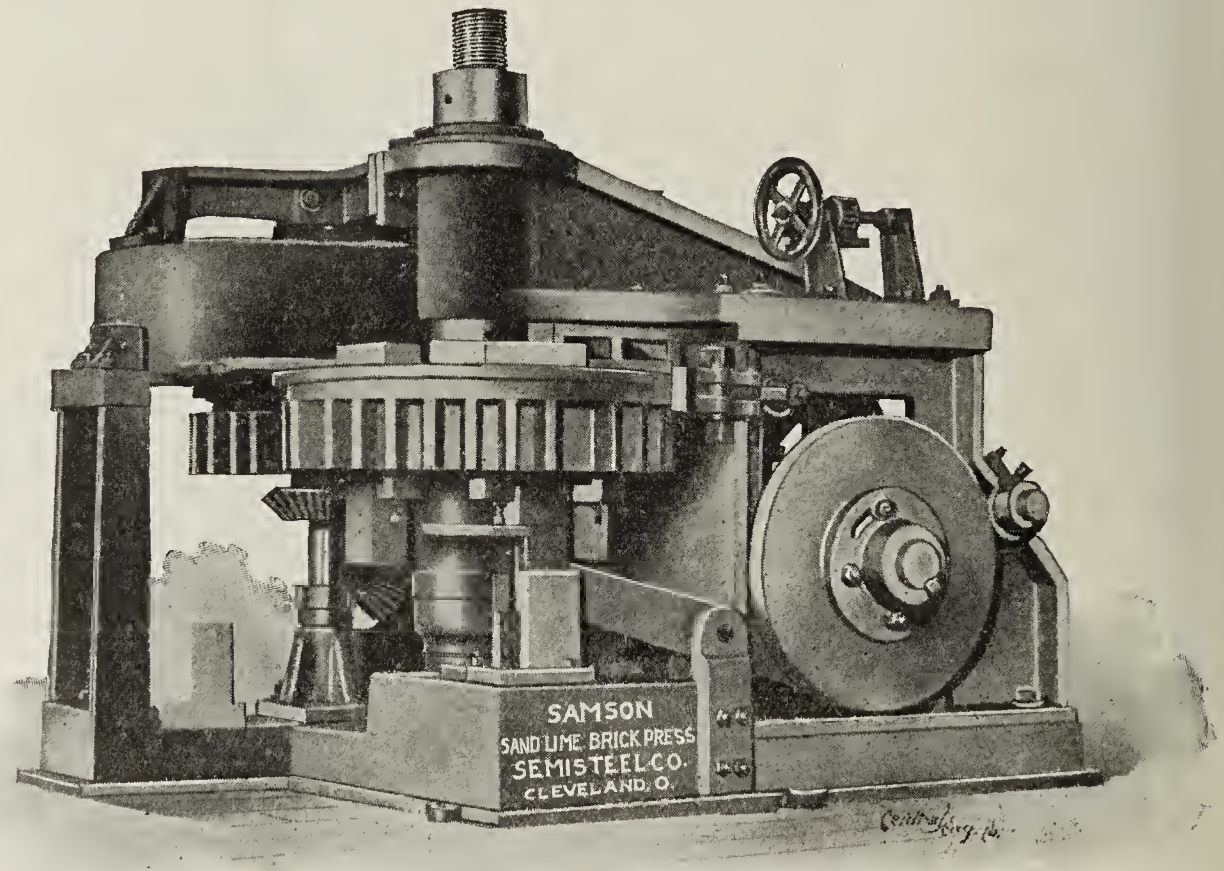

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25 Factories Designed, Equipped and Set in Operation During the Past Year in the United States and Canada.

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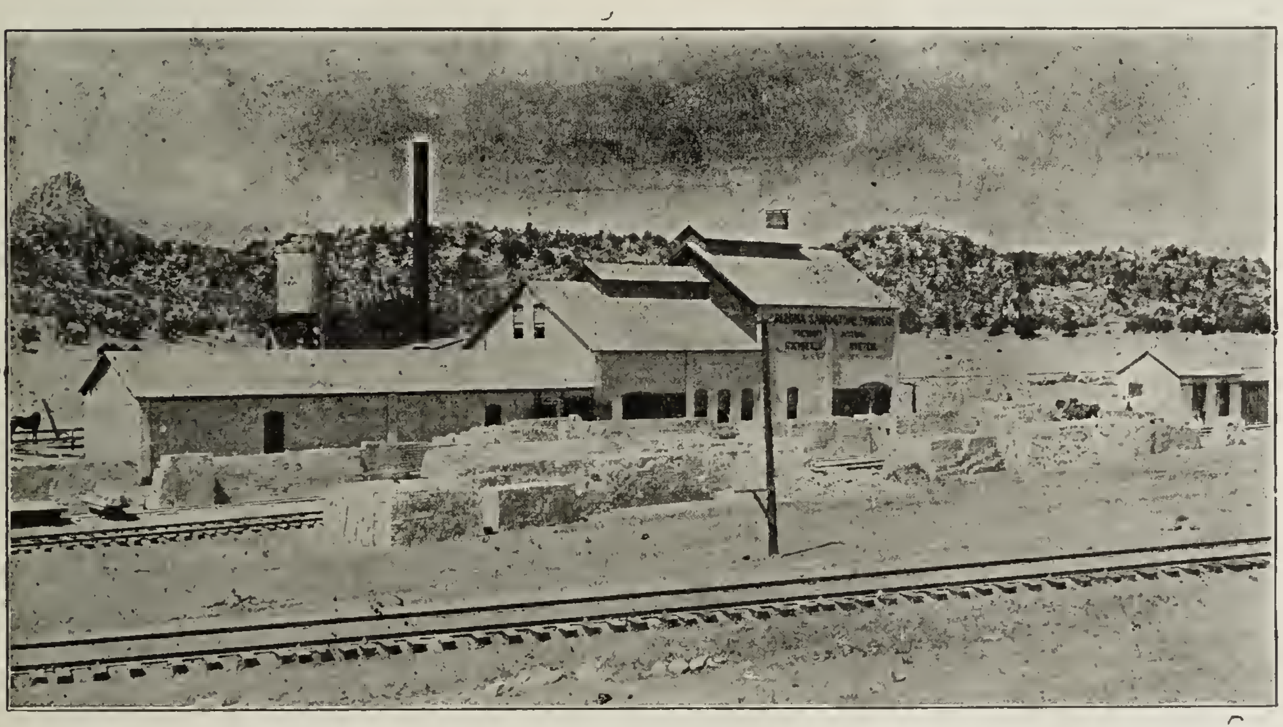

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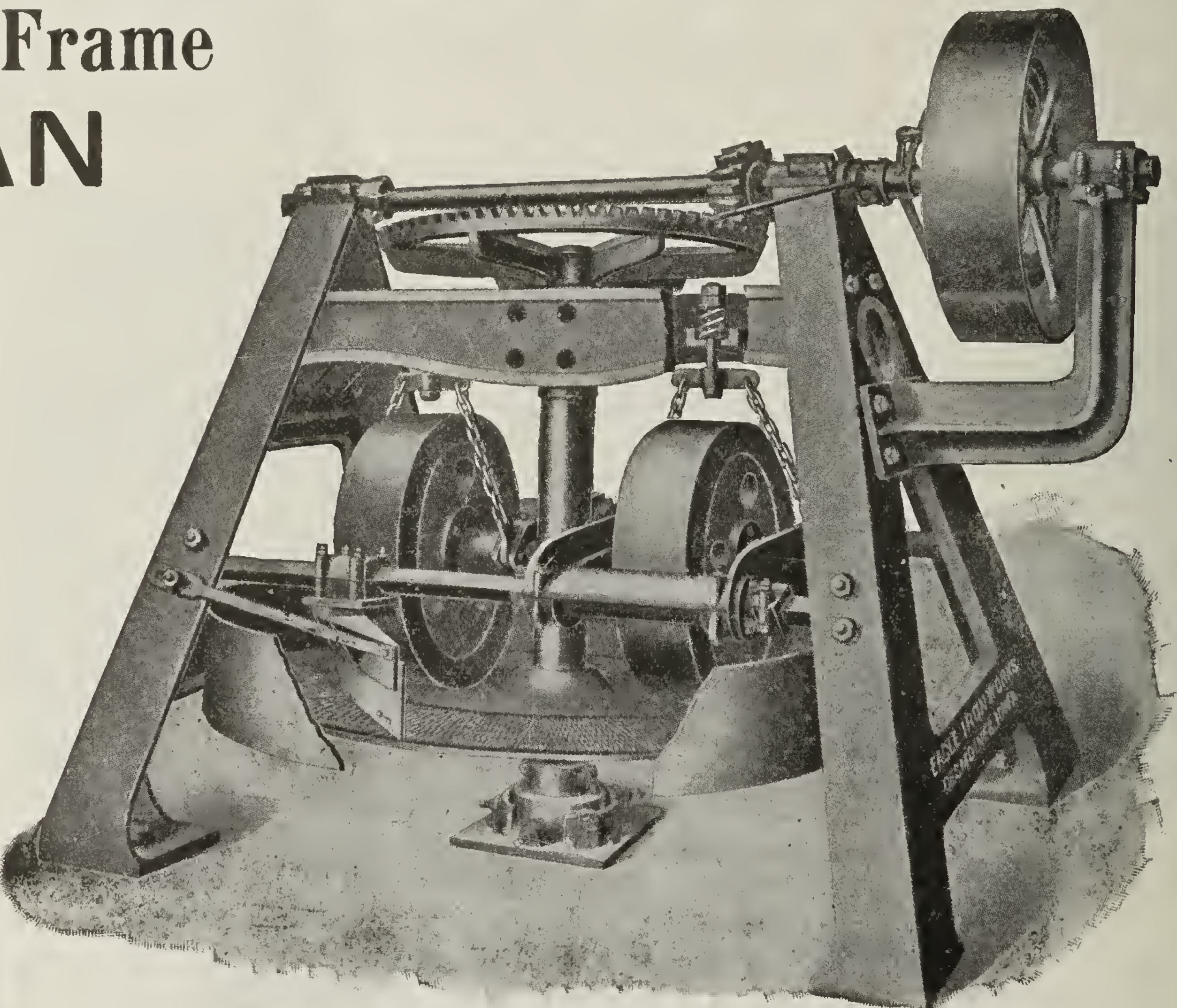

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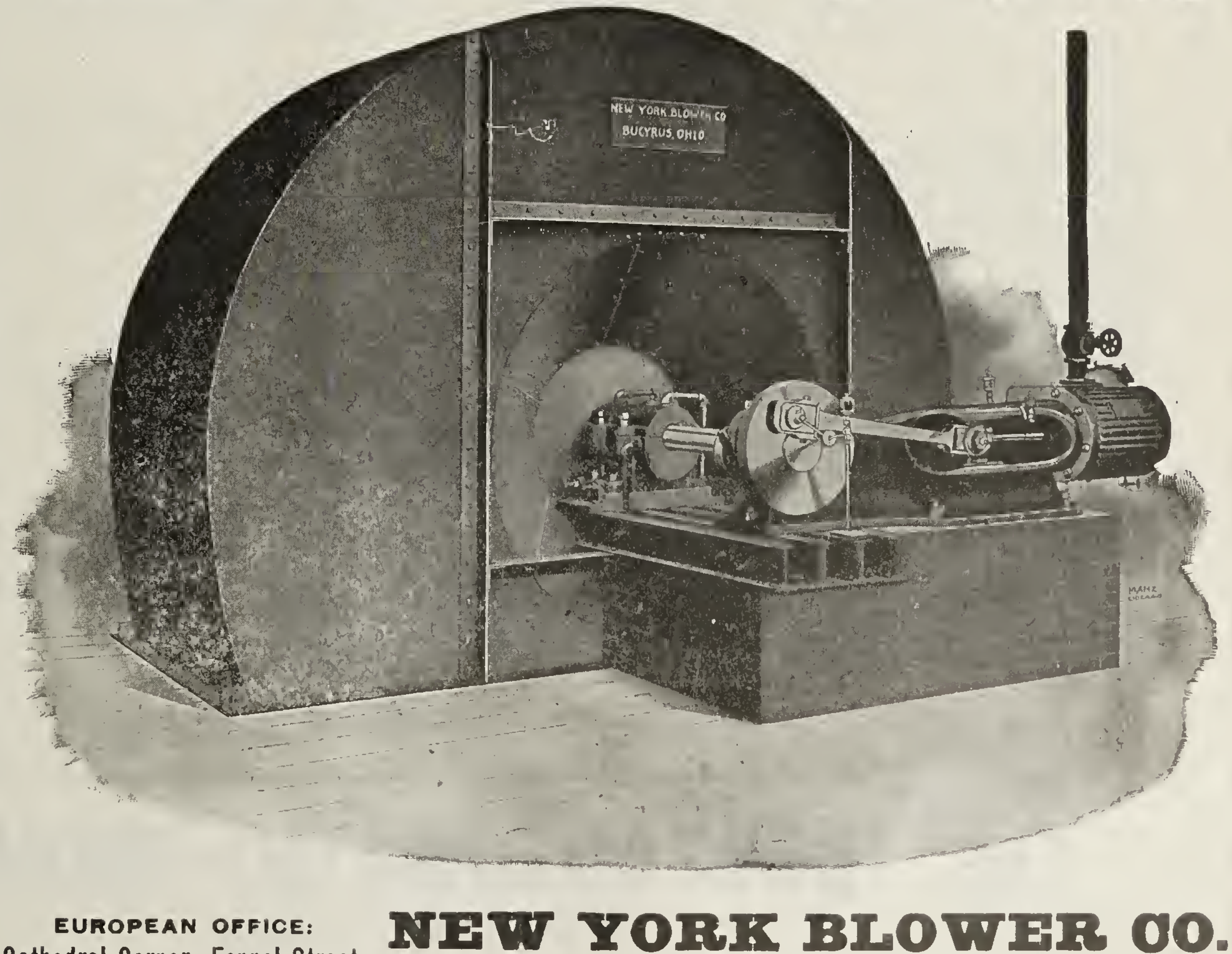
BLOOMINGTON, ILL.

WASTE HEAT CLAY DRYER.

We offer the New York Blower Company's Improved Waste Heat Dryer as the most successful means of utilizing the heat from the cooling kilns which is at present an absolute waste. The two important factors in drying are heat and circulation of air; one being as important as the other. These are both amply provided for in our dryer. By the use of mixing chamber, provided with the proper dampers fresh air can be admitted to the fan to reduce the temperature of the incoming gases to the proper degree. By changing the speed of the fan the amount of air blown into the tunnels is easily regulated. With this apparatus, by which you can readily regulate and control the heat and circulation, you have a dryer which will work successfully in all climates and temperatures The necessity of perfect circulation in a dryer should never be overlooked. With this end in view we provide additional circulating devices in our largest dryers. This maintains an even and positive circulation throughout the dryer and insures the successful drying of your brick.



CHICAGO OFFICE
25th Place and Stewart Avenue.

EUROPEAN OFFICE:
Cathedral Corner, Fennel Street,
MANCHESTER, ENGLAND.

NEW YORK BLOWER CO.
BUCYRUS, OHIO.

A RHYME OF REASON.

Rodgers knows a thing or two
Of importance—yes to you.
Don't delay; investigate;
Get in line before too late.
Economy in drying brick—
Rodgers shows you every trick—
Saving will result from it.

Do you ever wonder how
Rivals dry their brick and vow
You should make more money too,
Even with no more to do?
Rodgers knows—the trick is his;
Saving **Waste Heat** is his "biz."

L. E. RODGERS ENGINEERING CO.

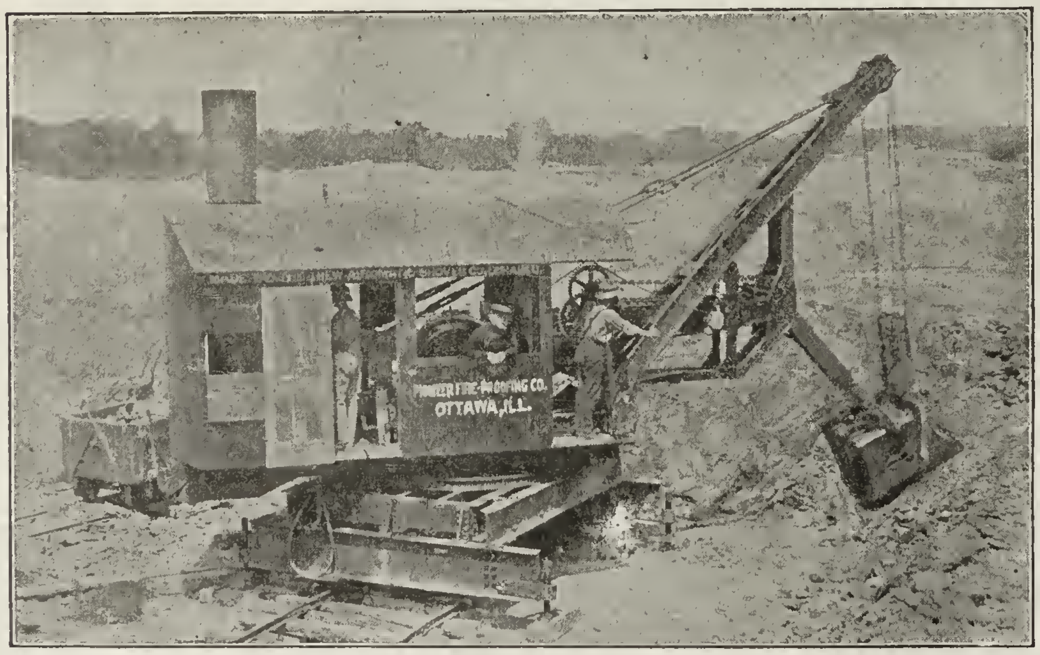
WASTE HEAT DRYER SPECIALISTS

303 Dearborn Street, *CHICAGO*

HANDLE YOUR CLAY WITH ONE MAN AND

The Thew Steam Shovels

Made In Four Sizes. Mounted on Car Wheels or Traction Wheels.



Type No. 2 Shovel—Pioneer Fireproofing Co., Ottawa, Ill.

Especially adapted for brickyard requirements. The shovel operates in a complete circle, enabling material to be delivered at side or in rear at will. The Dipper is hung from a horizontally moving carriage and can be adjusted to cut to any desired level.

: : Only One Operator Required.
Wire Cables used instead of Chains.
Strictly First-Class in Every Detail.

Economical for brickyards 30,000 to 40,000 daily capacity.

Operated by one man for outputs up to 125,000 brick per day.

Write us for Catalogues and Information.

THE THEW AUTOMATIC SHOVEL CO.,

LORAIN, OHIO.

A Perfect Clay Handling System.

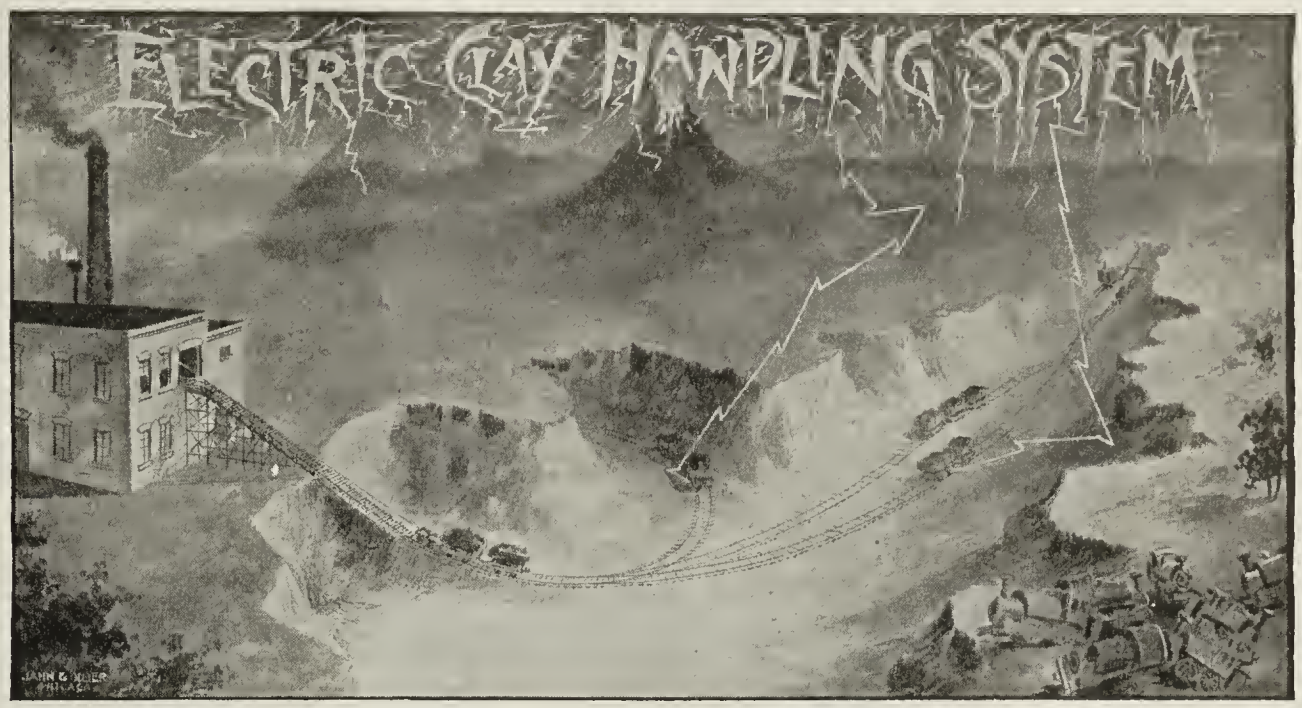
We install our system and turn it over to you under guarantee of satisfactory results.

We do not shut your plant down while installing.

Our entire system is operated and controlled by ONE man at the hoist, and no horses, locomotives, or men required between bank and machine.

Scarcely any power required.

We invite you to come and see a large plant in operation.



HAUSER COMPANY, CHICAGO

General and Electrical Contractors, Power Construction and the Design and Equipment of Modern Clay Working Plants.

Southwest to Prosperity

Get Rich in the Southwest. We know you can because thousands are already doing so. They have seized upon opportunities, and in developing the natural resources have opened the door of opportunity for others—opened it, mind you, not closed it. Don't wait for Prosperity to come to you. Go to Prosperity. Get Into partnership with the Southwest and you will have a partner that does not know what failure is. It is worth a great deal to you to be located in a prosperous, growing country that has not reached the dead level of development.

Opportunities. There are many opportunities for small manufactories, industries of various kinds, mechanics, merchants, farmers and stock-raisers. The best of them are along the new lines of the Rock Island, and our folder, Business Opportunities, will tell you all about them.

Mild Winters Southwest. Right here may be the difference between success and failure. You can work more days in every year in the Southwest than in the East and North—the land works with you. The earning capacity of the land is greater, the earning capacity of every man is greater, whether farmer, mechanic or tradesman. They're plowing in their shirt sleeves in the Southwest **to-day.** Think of that. The climate is mild and pleasant, the soil rich and markets good. Nowhere in the world is there such an opportunity for men who want to improve their condition.

How We Can Help. The Rock Island has no land to sell, but is deeply interested in inducing a desirable class of people to locate tributary to its lines. To do this we maintain a department for the purpose of giving truthful and complete information regarding every opening that exists in our vast territory. We have collected valuable data about all the districts along our lines. We will tell you where the openings are, the amount of capital needed and the price of lands.

Low Rates. To enable you to look the country over, very low Homeseekers' rates are made by the Rock Island.

Act at Once if you want the first choice. There are hundreds who will read this and decide that the Southwest is the place for them, and they will never regret it. Fill out the coupon below and mail it to the undersigned. All your questions will be promptly answered by personal letter. **Do it to-day.**

Please send me illustrated booklet about____________________(name section) with full information and particulars of reduced rates to that section.

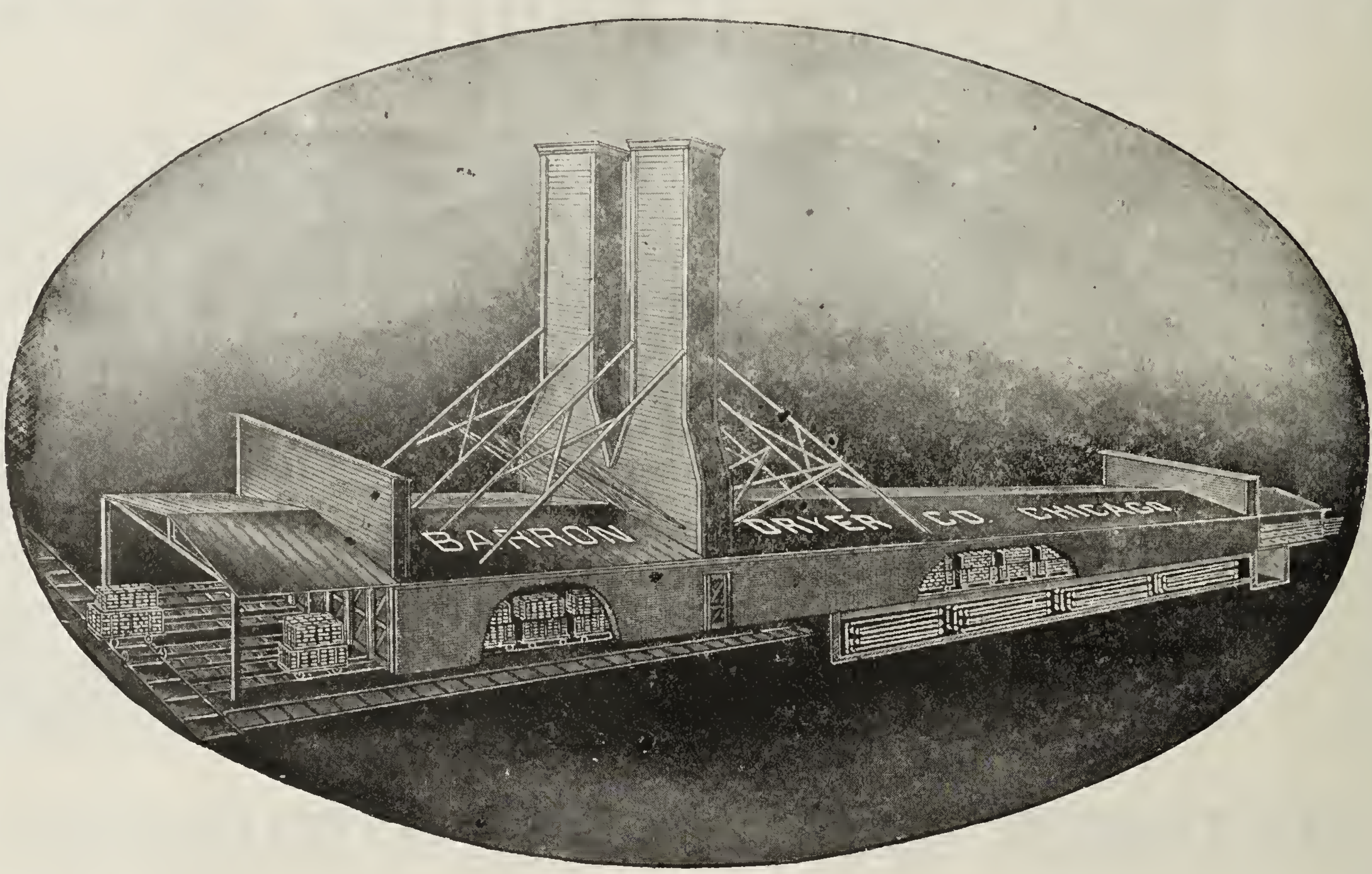
Name____________________

P. O. Address____________________

State____________________

Rock Island System

JOHN SEBASTIAN, Passenger Traffic Manager, Rock Island System, Chicago, Ill.



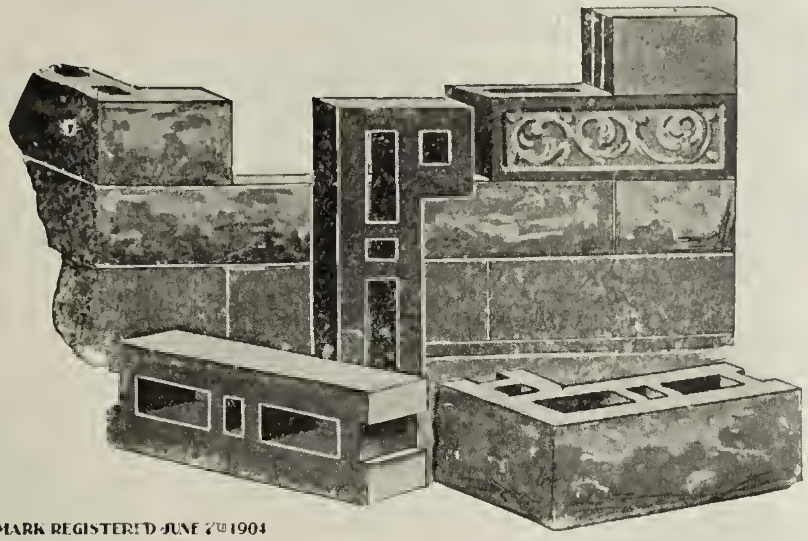
If You Are Progressive

You know that the brickmakers who are making the money in these days are those who have installed an up-to-date drying system enabling them to cope with ease with the heaviest demands of the market, their operations being uninterrupted all the year round.

This is true of them, what of your case? Why adhere still to antiquated methods subjected to weather limitations. Determine to install the most effective drying system in existence and apply for information and quotations to the

BARRON DRYER COMPANY

Temple Court Building, 225 Dearborn Street, CHICAGO, ILL.



TRADE MARK REGISTERED JUNE 7th 1904
BY HARMON S PALMER HOLLOW CONCRETE
BUILDING BLOCK COMPANY.

PALMER'S MACHINE

IT IS THE BEST BY EVERY TEST

ALL OF
THESE POINTS
ARE COVERED
BY PATENTS
TO US AND
NO OTHERS.
FOUR PARTIES
HAVE
ALREADY BEEN
ENJOINED
BY US IN
UNITED
STATES
COURTS
FOR
INFRINGING
OUR PATENTS.

BECAUSE:

It makes all lengths from **four** to **thirty-two** inches.

It makes all widths from **four** to **eighteen** inches.

It makes all heights from **one** to **nine** inches.

It makes all angles for **bay-windows.**

It makes blocks of different contour by removable face plates with patented designs.

It makes **joist** blocks and **nelting-courses.**

It was invented by a **practical** builder who knew what was necessary.

Its proportion as to strength and weight are correct.

It is not a cumbersome and bungling piece of mechanism.

Every block necessary to complete system of construction made by Palmer's machine. No waste.

Don't be deceived into buying a machine just because it makes a hole in a block. This is like poison to our business.

Beware of charlatans and mountebanks who know nothing of the business, but want the public's money on the reputation and success of others.

Report infringing machines to Mr. Frank L. Wolfe, Two Rivers, Wis., Secretary National Organization ot Cement Block Makers.

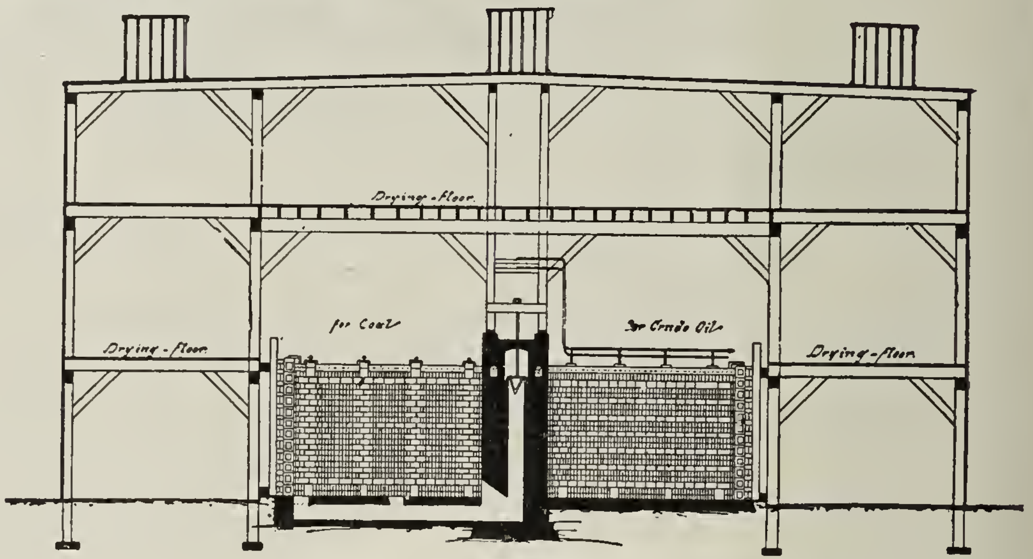
THE HARMON S. PALMER COMPANY

WASHINGTON, D. C.

Lehmann Portable Continuous Kiln in Combination with Drying Floors...

CHEAPEST AND SIMPLEST CONTINUOUS KILN ON THE MARKET

Can be constructed ready for work in six to eight weeks, and adapted to all kinds of fuel. Saves 65 to 75 per cent. on fuel as compared with up-draft or down-draft kilns. Drying is done by heat escaping from kiln without extra expense, gradually, uniformly and thoroughly. Goods are handled by automatic delivery elevators, and cost of handling, drying and burning is reduced to a minimum.



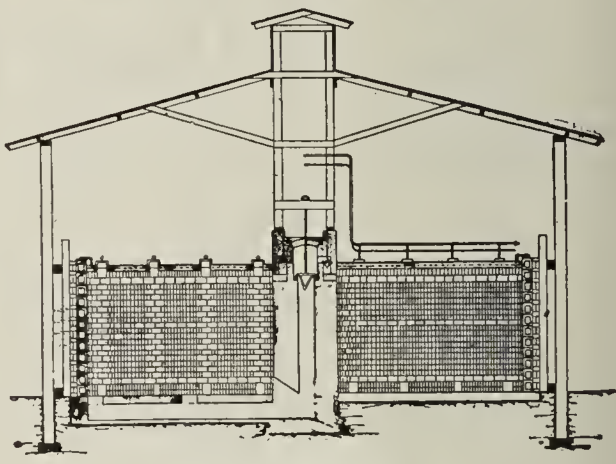
KILN AND DRYING FLOOR.

Lehmann Crude Oil Burning Apparatus

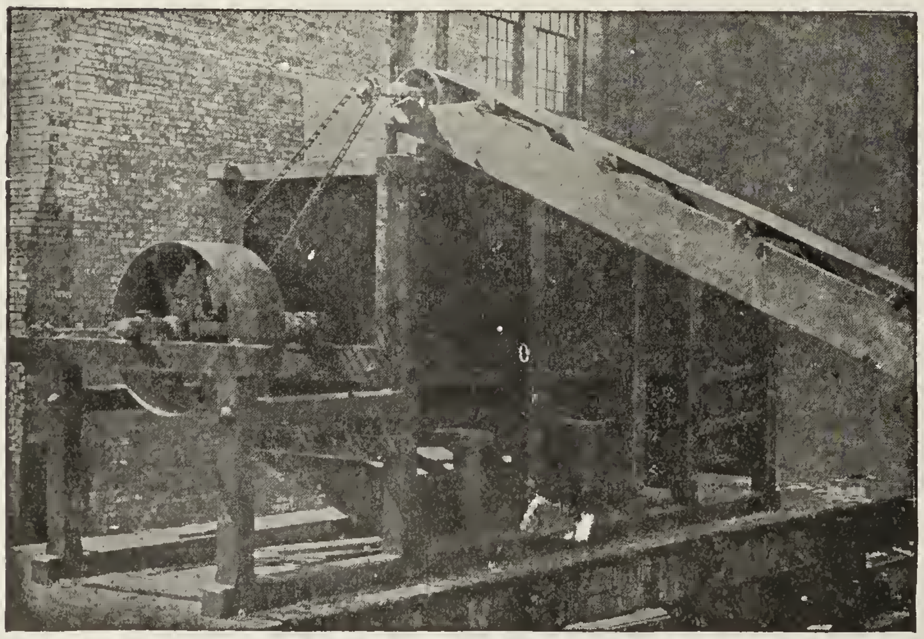
First successful attempt to burn Crude Oil in a Continuous Kiln; can be applied to any system.

Lehmann Metal Lined, Self-Lubricating Die

Can be made and adapted to any kind of clay at the place of manufacture, and insures uniformity of size of manufactured goods.



CONTINUOUS KILN



LEHMANN SLUMMING MACHINE

Lehmann Slumming Machine

MOST PRACTICAL, SIMPLE AND EFFECTIVE

The slumming process is the most economical and the only reliable method for removing gravel and other foreign matter from Common Clay, Kaolin, Chalk, Mineral Paints, etc.

ALL THESE DEVICES HAVE BEEN TRIED THOROUGHLY AND SUCCESSFULLY.

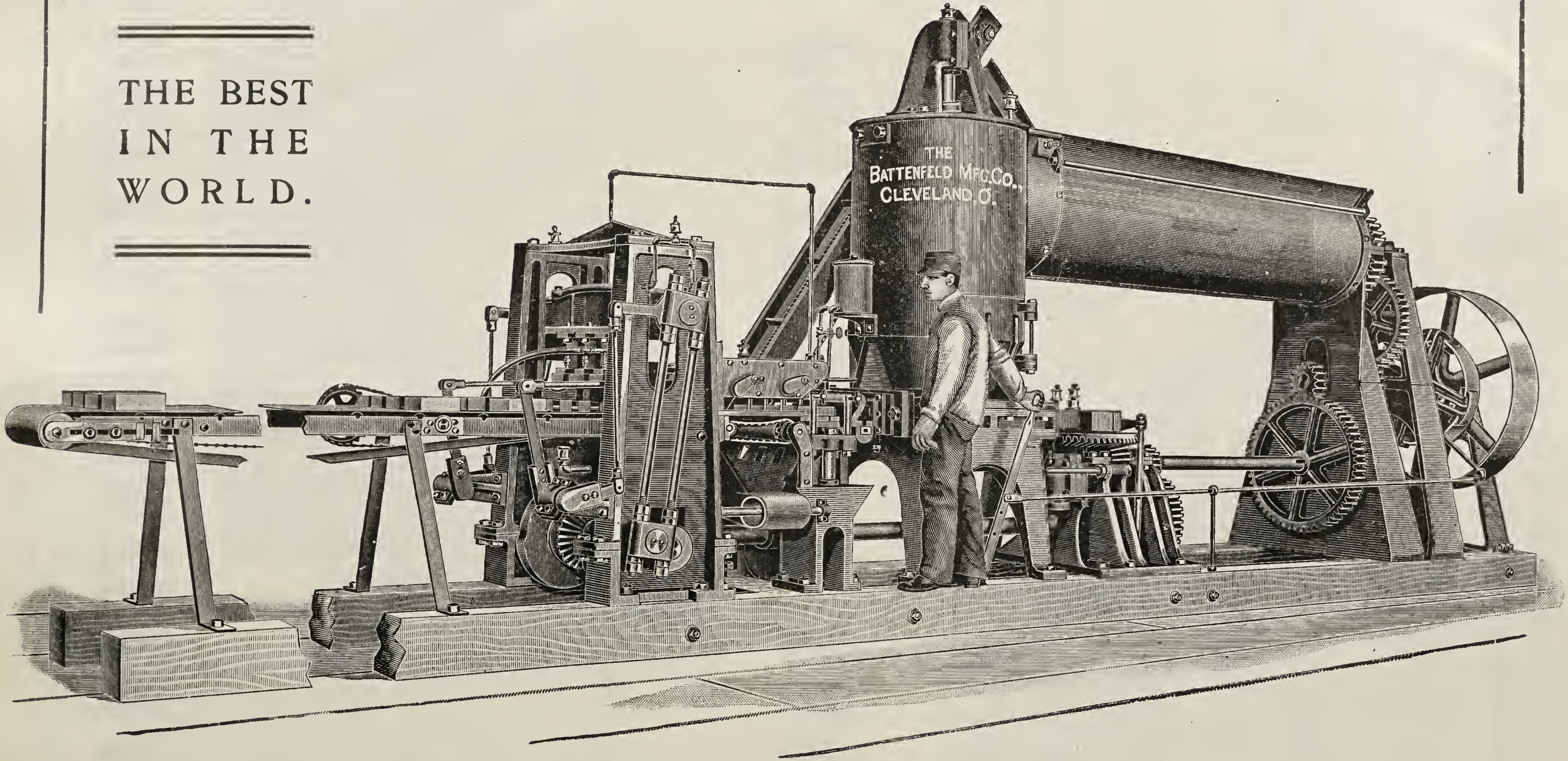
Will plan and construct any system of Kiln . . . Up-Draft, Down-Draft, Muffle or Tunnel. Plans and estimates furnished for Brick and Tile, Lime and Cement Work. Practical tests made.

F. LEHMANN COMPANY

Consulting Clay-Worker Engineers,
163 Rhine Street, Chicago, Ill.

THE DICTATOR BRICK MACHINE

THE BEST
IN THE
WORLD.

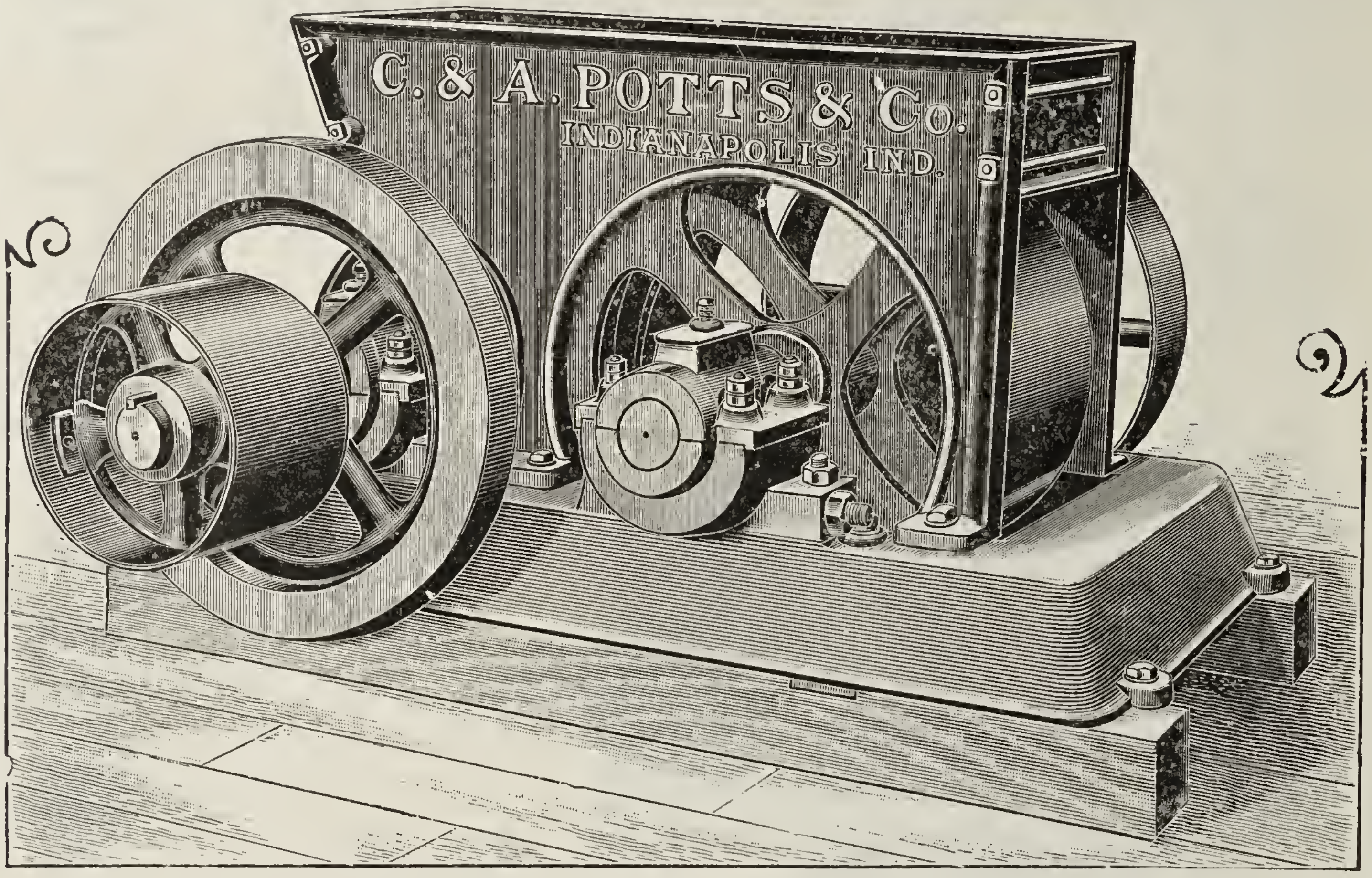

THE
BATTENFELD MFG.CO.
CLEVELAND, O.

THE BATTENFELD MFG. CO.

WRITE FOR CATALOGUE.

CLEVELAND, OHIO.

THE POTTS DISINTEGRATOR


C. & A. POTTS & Co.
INDIANAPOLIS IND.

Is not a spite machine, but is built the best possible. Having Heavy Chilled Rolls, Ring Oiling Bearings, Shafts of Steel and large in Diameter. The most successful machine for grinding out sticky clays and separating the stone.

THE POTTS MOULD SANDER

Simple in Construction,

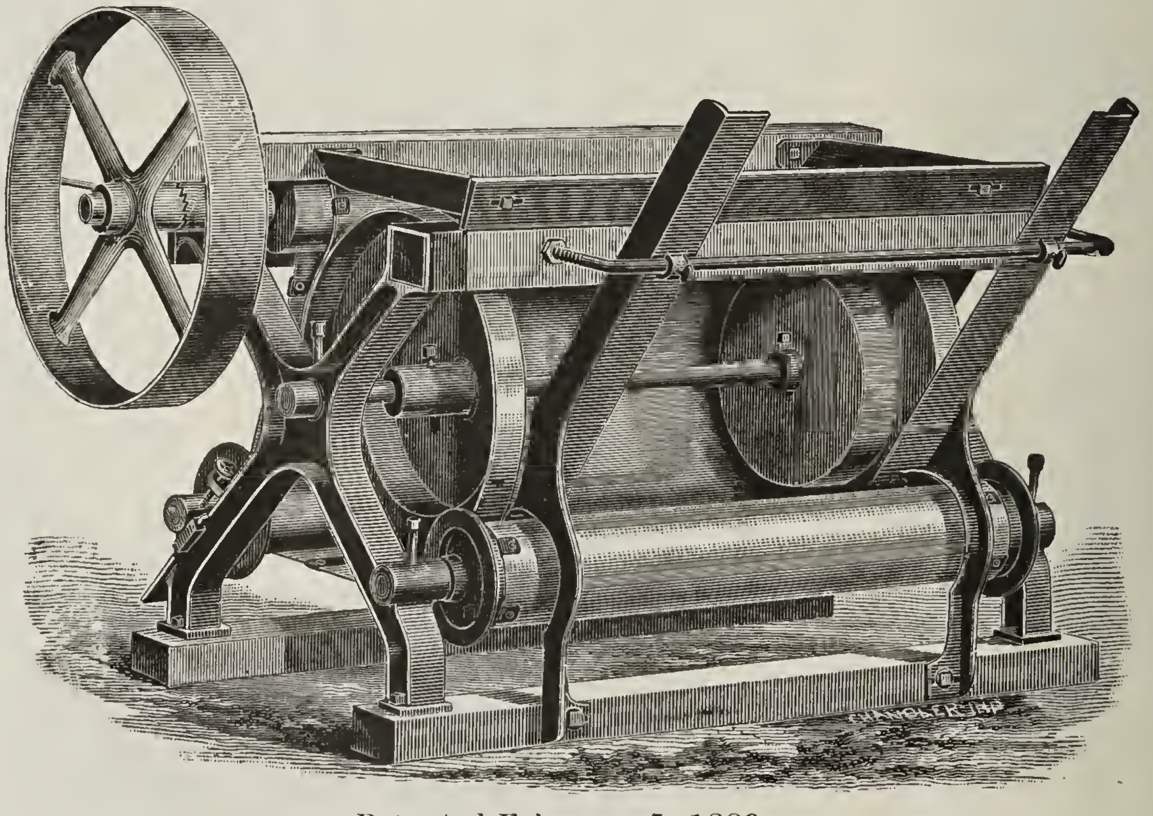
Strong and Durable,

Sands the Moulds Perfectly,

Never Strikes or gets Drunk,

Always Ready for Work,

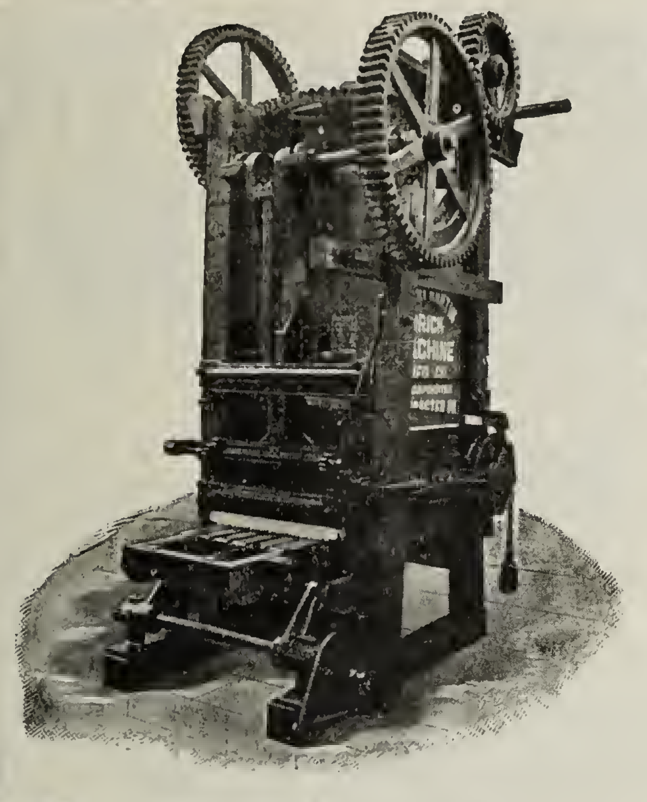
No Brick Machine Complete without this Machine.



Patented February 5, 1889.

We make a specialty of equipping Sand Mould plants complete. We are the largest manufacturers of this class of machinery in the world. Write for prices.

C. & A. POTTS & CO., Indianaoplis, Ind.



THERE'S A REASON
WHY
THE "MARTIN"
BRICK MAKING MACHINERY
HAS PROVEN SO SUCCESSFUL

IT'S THE WAY IT'S BUILT

Turns out square cornered brick with smooth faces, and at a capacity limited only by the facilities on the brick yard. The

MARTIN STYLE "A"

will prove a most profitable investment for any brick maker.

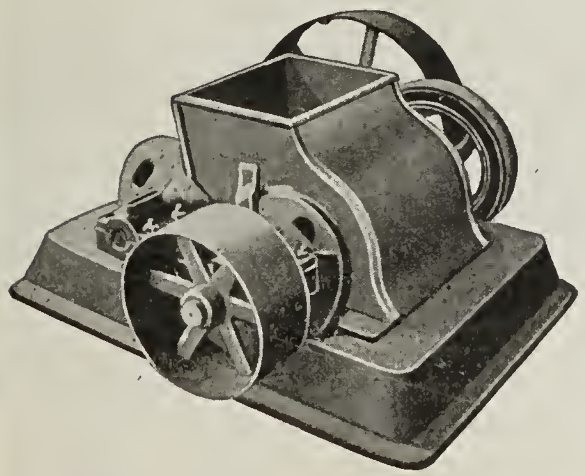
CRUSHERS—SCREENS—CONVEYORS

FOR EVERY REQUIREMENT.

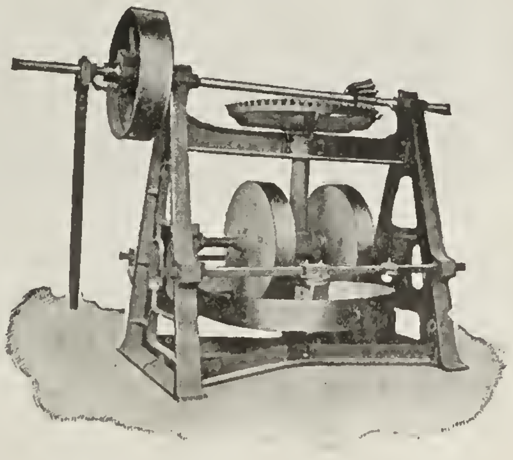
Let us send you a copy of our complete catalog No. 90A, showing our line of "Everything a Brickmaker Needs."

BRICK-YARD SUPPLIES

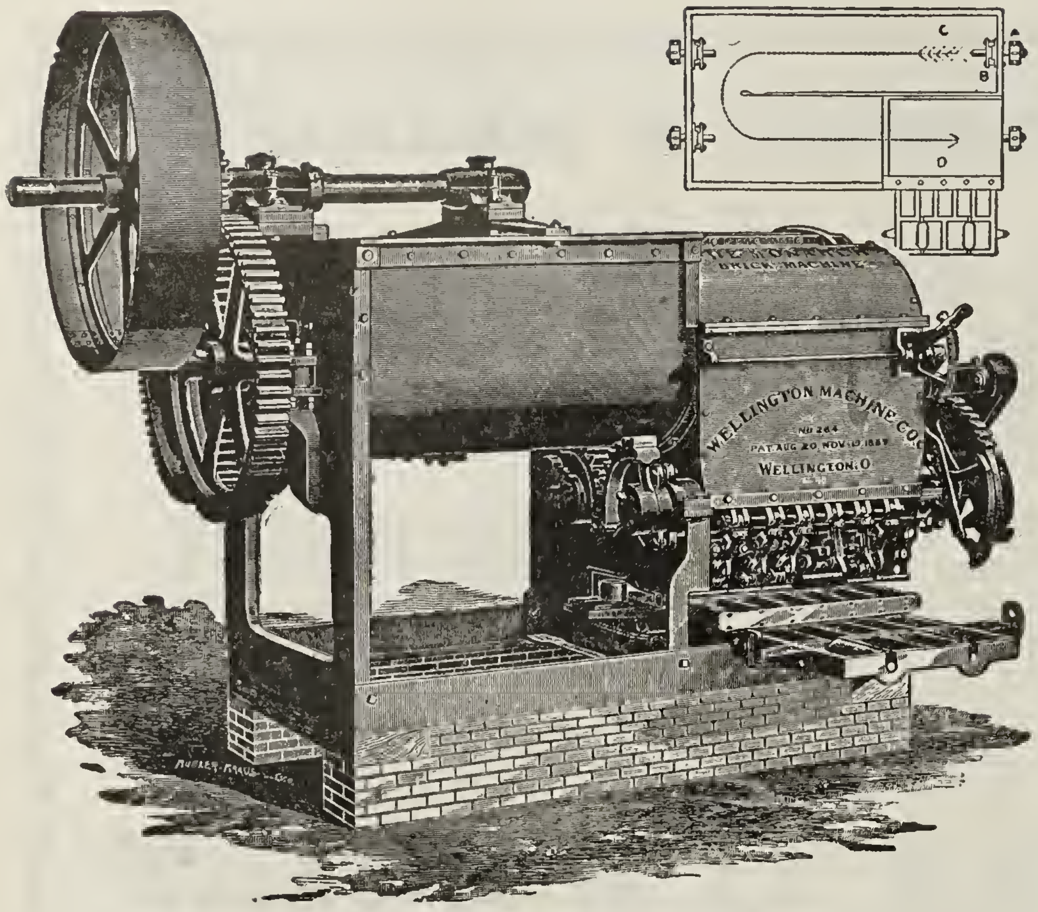
Shipped immediately from stock. **BRICK MOULDS** are a specialty with us.



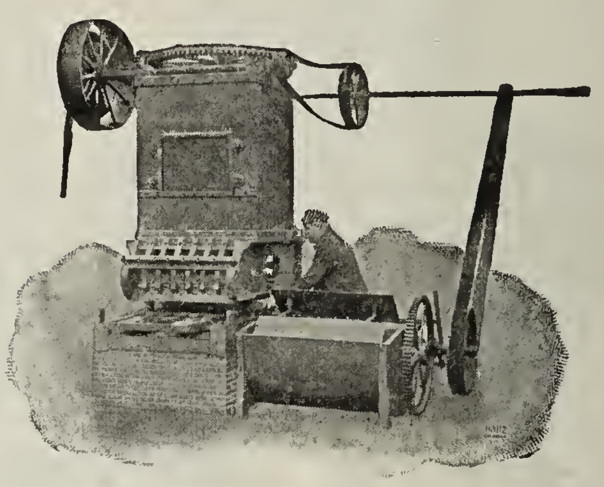
THE HENRY MARTIN
BRICK MACHINE
MFG. CO.
INC.
Lancaster, Pa., U. S. A.



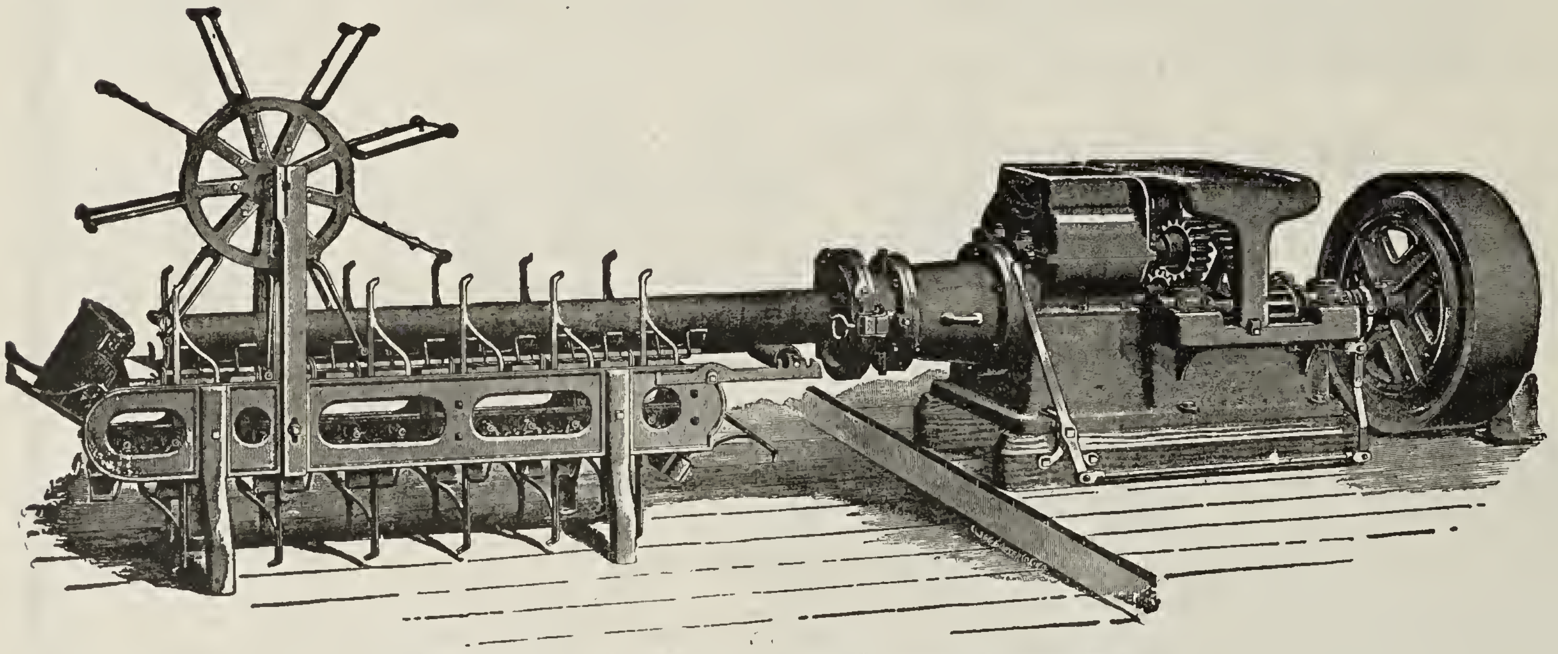
BRICK and TILE MACHINERY



MONARCH STOCK BRICK MACHINE
Capacity, from 30,000 to 50,000

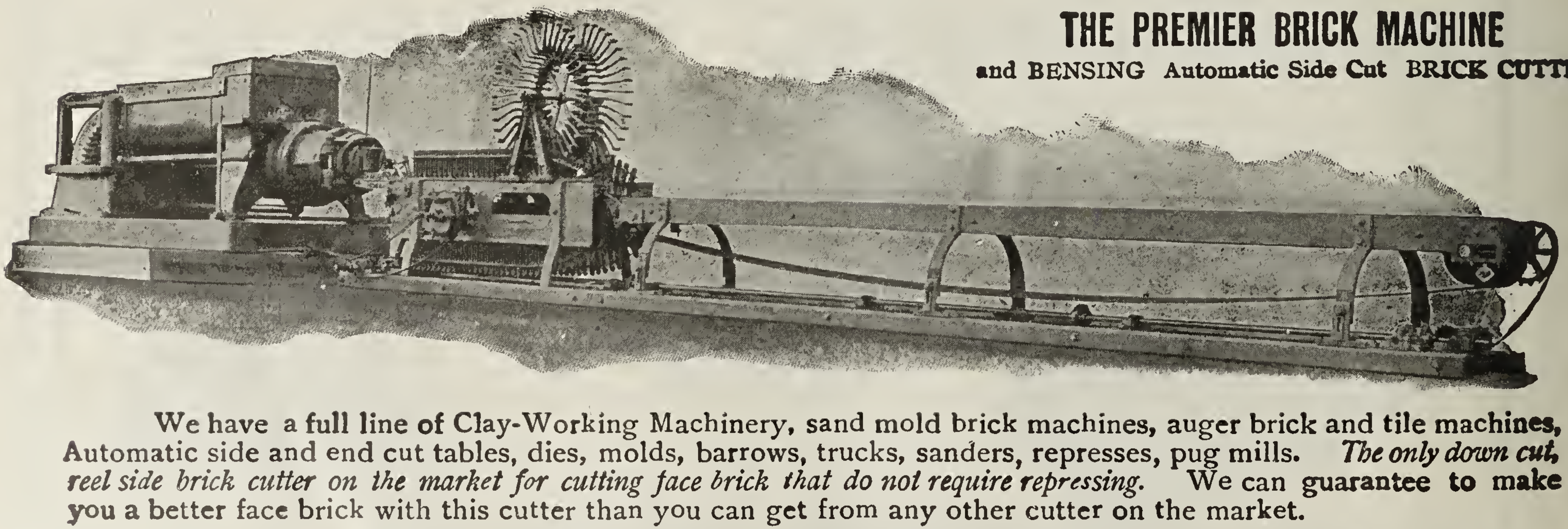


THE QUAKER
Horse or Steam Power. Capacity, 20,00 to 35,000



BRICK OR TILE MACHINE, WITH AUTOMATIC TABLE

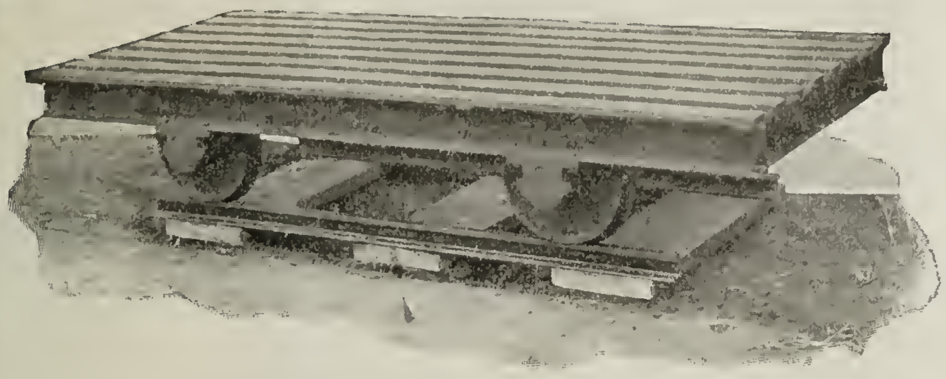
"We Fulfill our Guarantees."



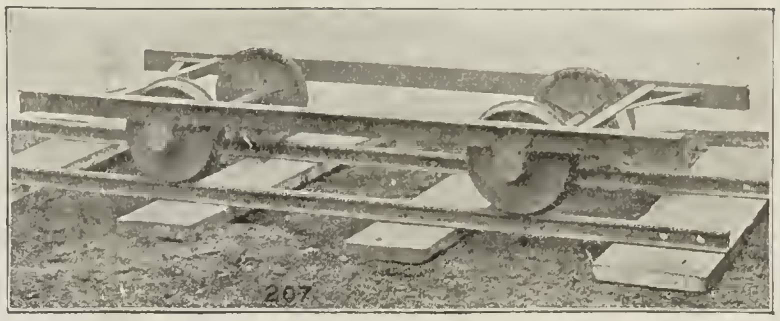
THE PREMIER BRICK MACHINE
and BENSING Automatic Side Cut BRICK CUTTER.

We have a full line of Clay-Working Machinery, sand mold brick machines, auger brick and tile machines, Automatic side and end cut tables, dies, molds, barrows, trucks, sanders, represses, pug mills. *The only down cut, reel side brick cutter on the market for cutting face brick that do not require repressing.* We can guarantee to make you a better face brick with this cutter than you can get from any other cutter on the market.

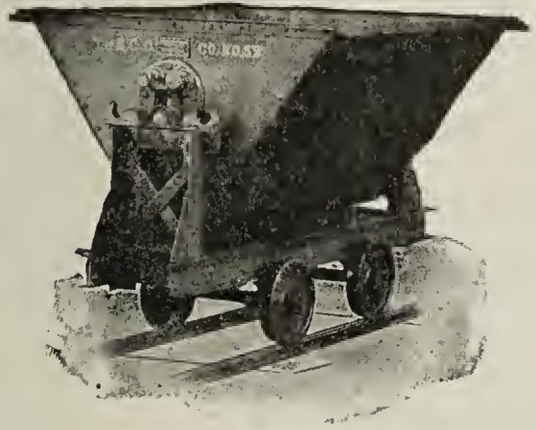
B. E. LaDOW, 701 Dwight Building, KANSAS CITY, MO.



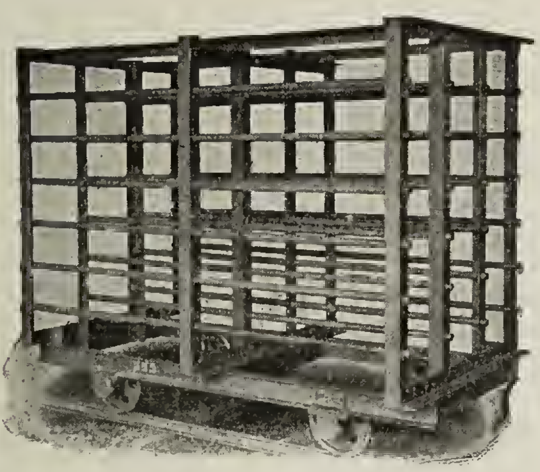
No. 212.
STEEL DECK CAR, CHANNEL FRAME.
For Drying Brick, Sewer Pipe, Etc.



No. 207.
FLAT CAR, WOODEN DECK.
For Brick, Tile, Etc.



No. 52.
TRUNION DUMP CAR.
For Handling Coal, Sand, Ashes, Etc.



No. 523.
RACK CAR, HEAVY TYPE.
For Use With Coke Oven, Furnace and Cupola Block.

The Cleveland Car Company

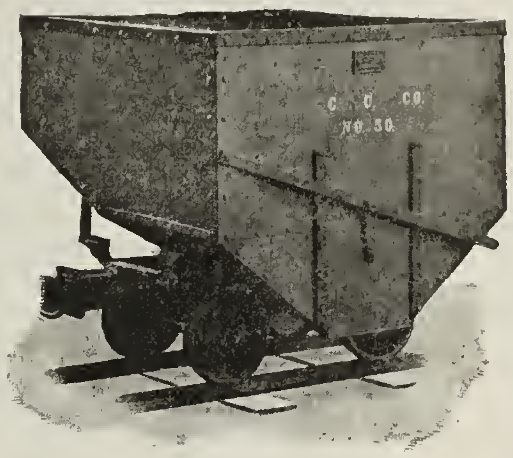
West Park -:- Ohio

Designers and Builders of

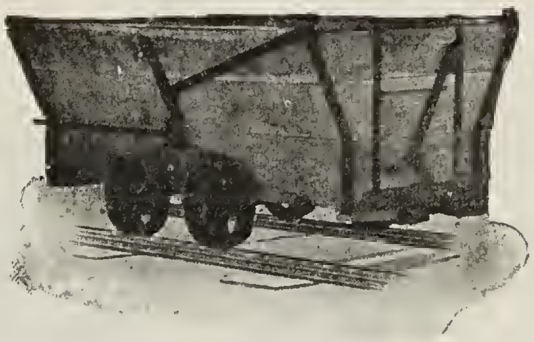
Complete Equipment for Narrow Guage Railroads

Dryer Cars of Every Description, Dump Cars, Turn Tables, Transfer Cars, Switches, Frogs, Rails, Etc.

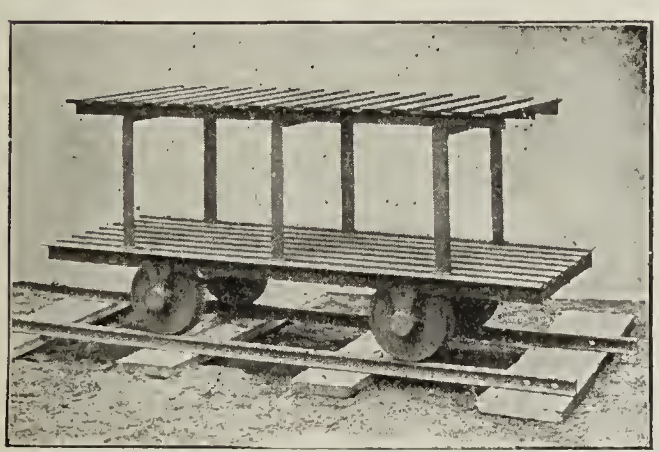
Overhead Trolleys, Kiln Doors, Furnace Fronts, Grate Bars and Brick Barrows : : : :



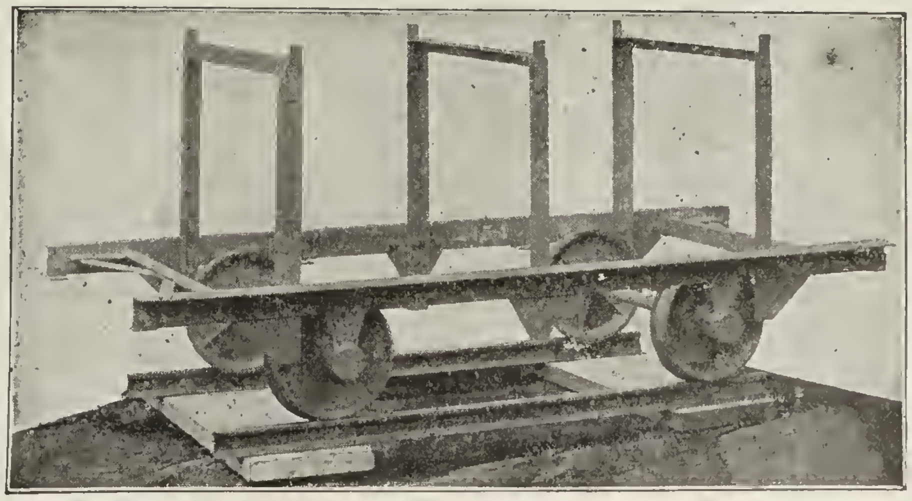
No. 50.
ONE SIDE DUMP CAR.
For Dumping Into Dry Pans, Disintegrators and Crushers.



No. 31.
END DUMP CAR.
Adapted to Handling Coal, Shale, Sand, Etc.

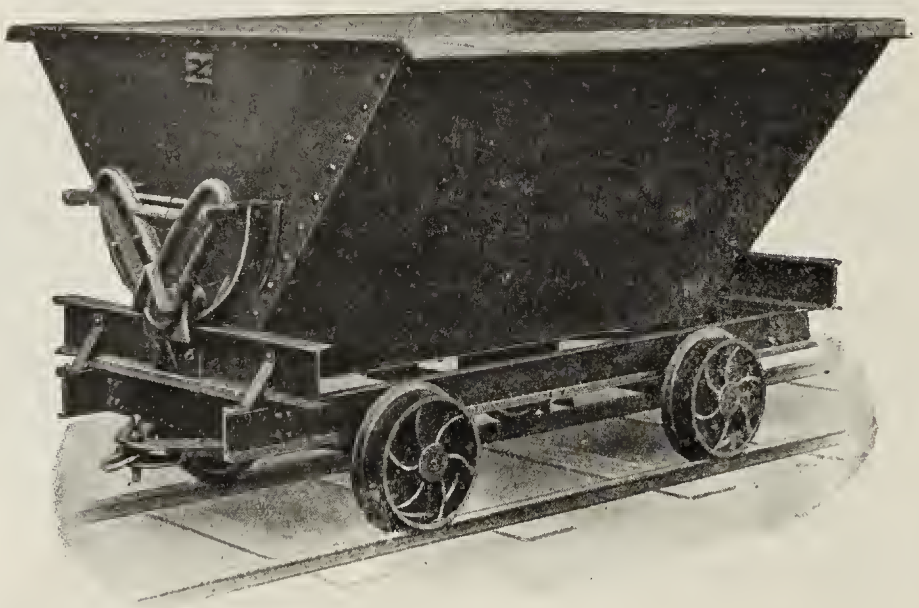


No. 244.
DOUBLE DECK CAR, STEEL DECKS.
For Brick, Tile, Fire-Proofing, Etc.



No. 245A.
DOUBLE DECK CAR, WOODEN DECK.
For Brick and Other Clay Products.

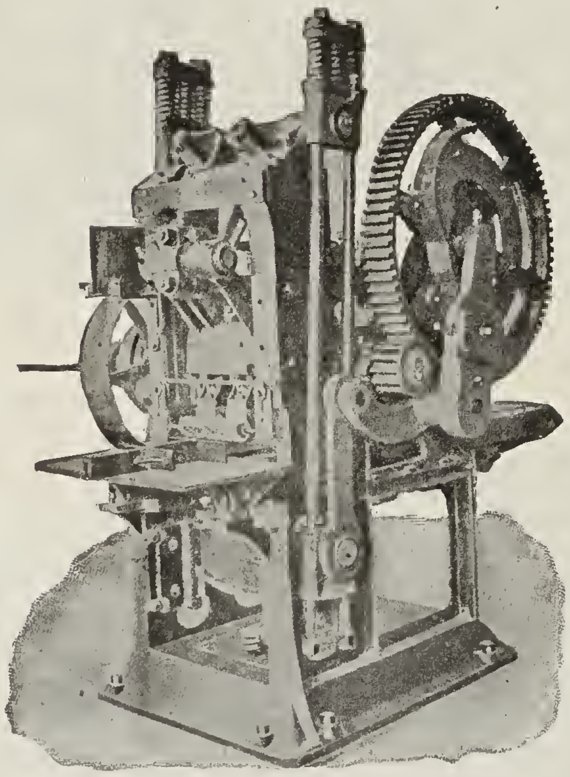
Are Your Clay Cars Satisfactory?



Clay Car.

If not, we can send some which we guarantee will be. They have no chains or pins to get lost or broken, cars cannot overdump, are self-locking, self-centering, easy running and durable.

We also build dryer cars of all kinds for all purposes.



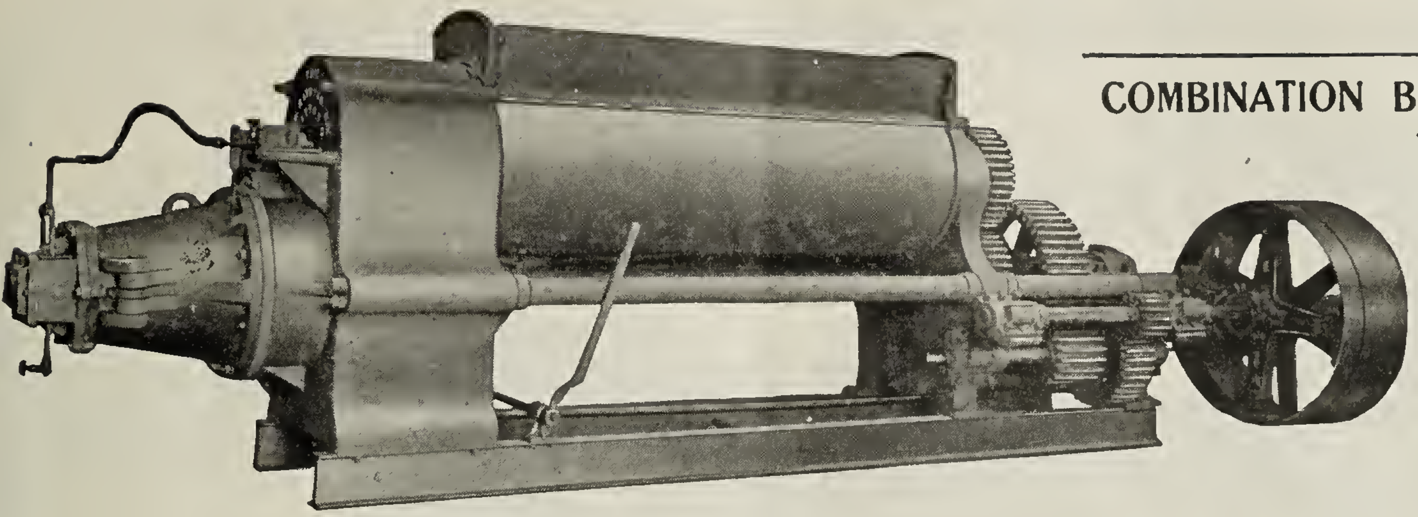
Richardson Double Die Repress.

The Richardson Repress has all the features of merit that are demanded of a machine of this kind. Has enough depth of mold to make the largest size paving brick. All the working parts are above dies out of the way of waste clay. It has a slow pressing movement with double pressure, bringing out distinctly all markings and lettering. The working parts are adjustible to wear. It requires very little power and costs little to keep in repair.

Kindly write us for catalogs and full information.

The Ohio Ceramic Engineering Company

50-56 Fall Street, Cleveland, Ohio.



COMBINATION BRICK MACHINE

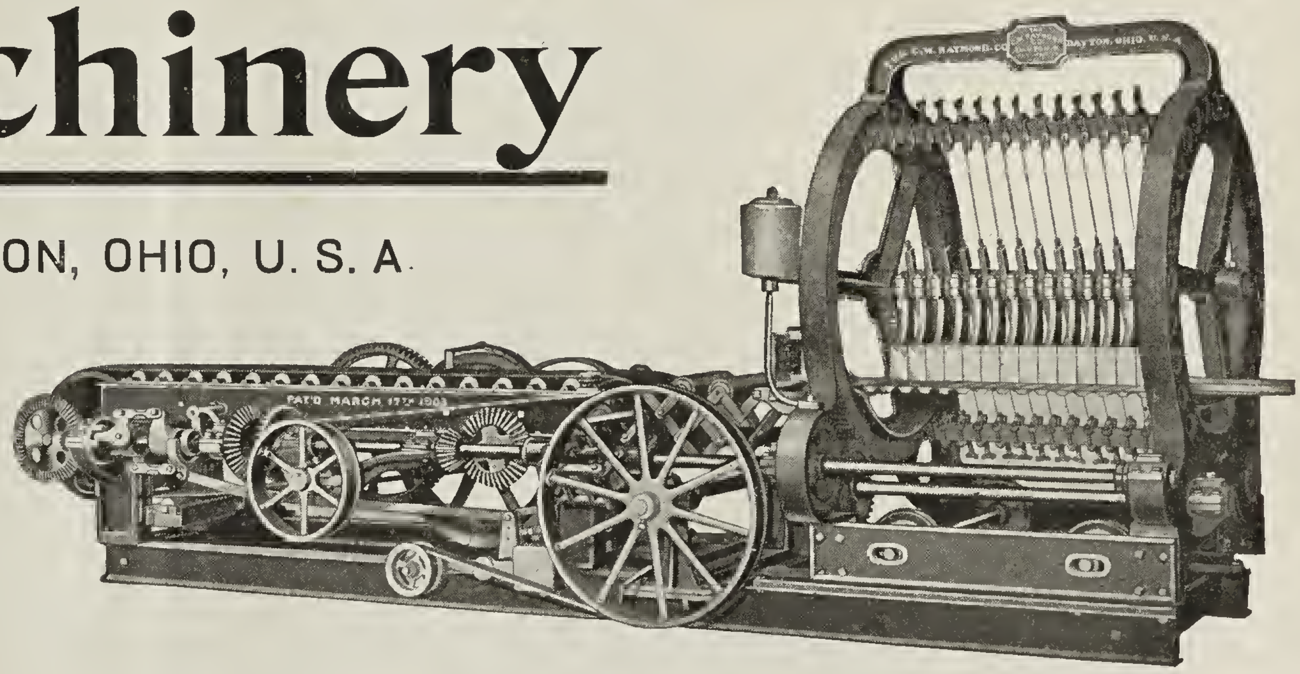
THE

C. W. RAYMOND CO

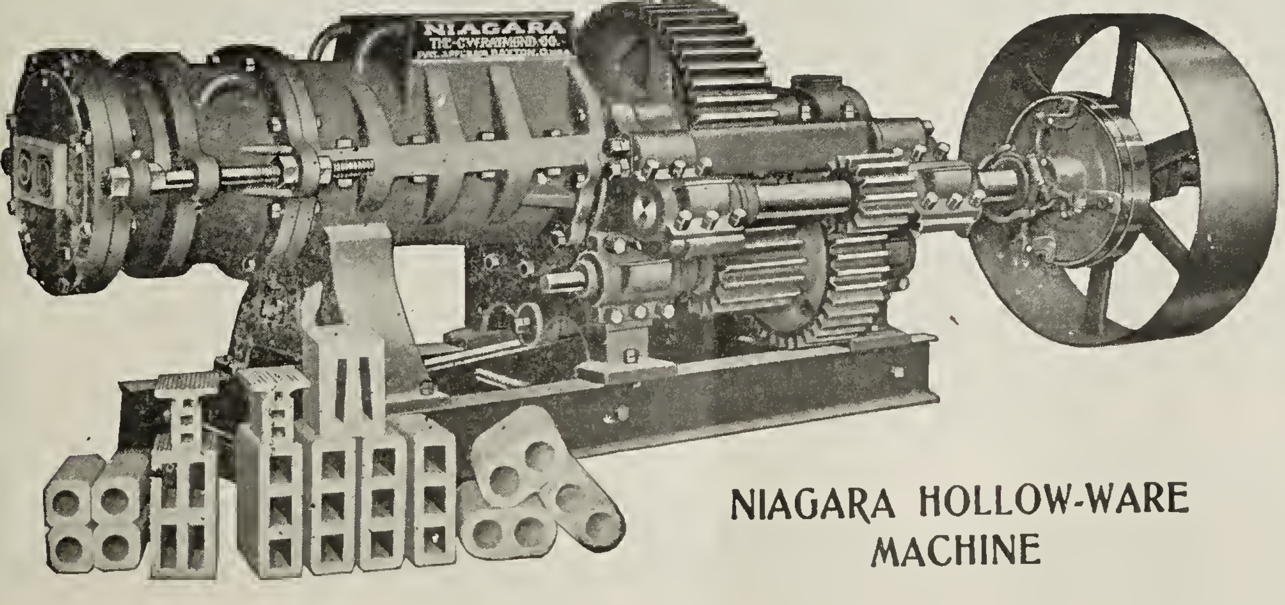
Clay-Working Machinery

DAYTON, OHIO, U. S. A.

NEW YORK
39—41 Cortlandt Street
ST. LOUIS
315 Frisco Building
PITTSBURG
1425 Park Building



AUTOMATIC DOWN-CUT CUTTER

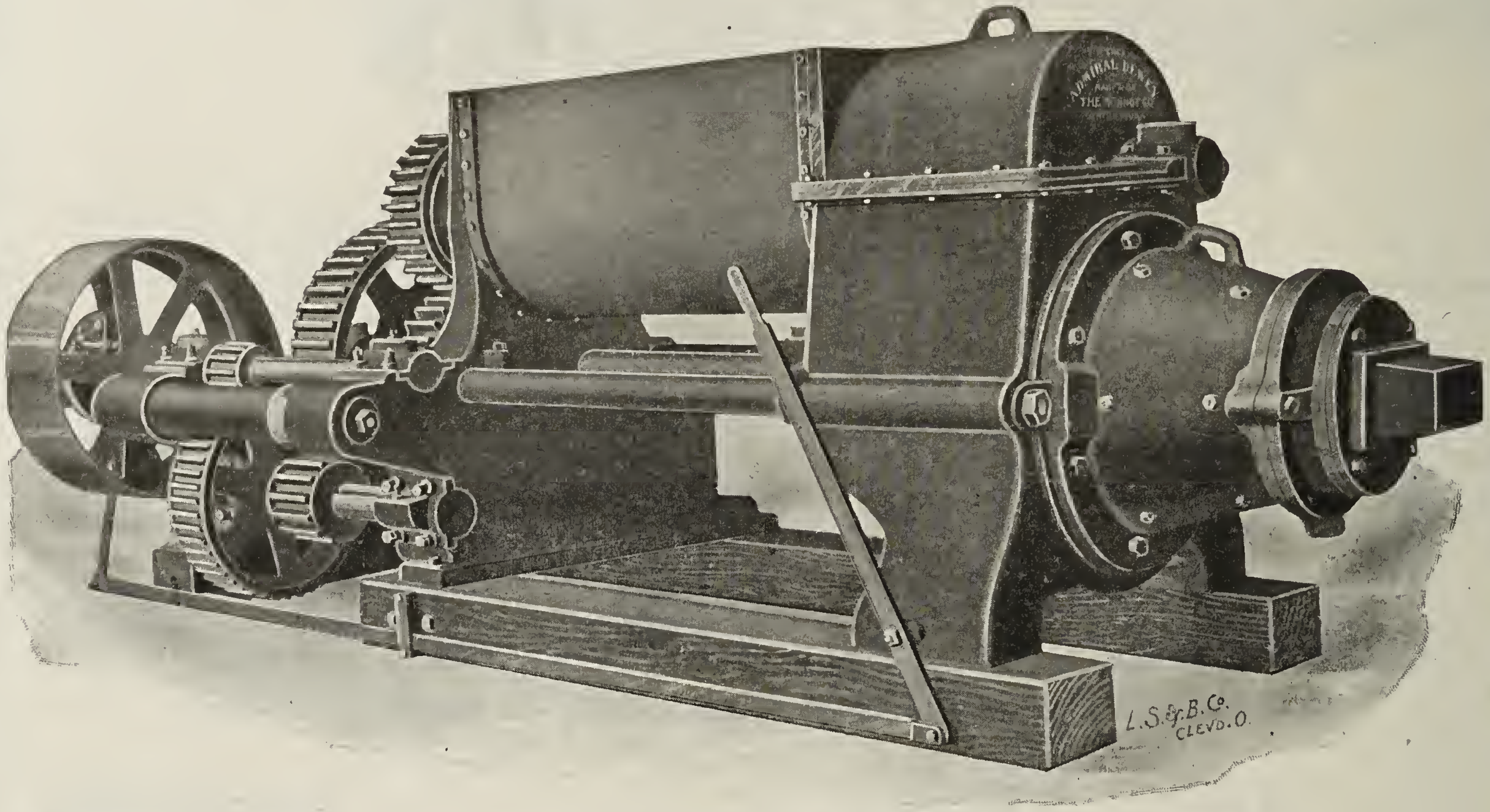


NIAGARA HOLLOW-WARE MACHINE

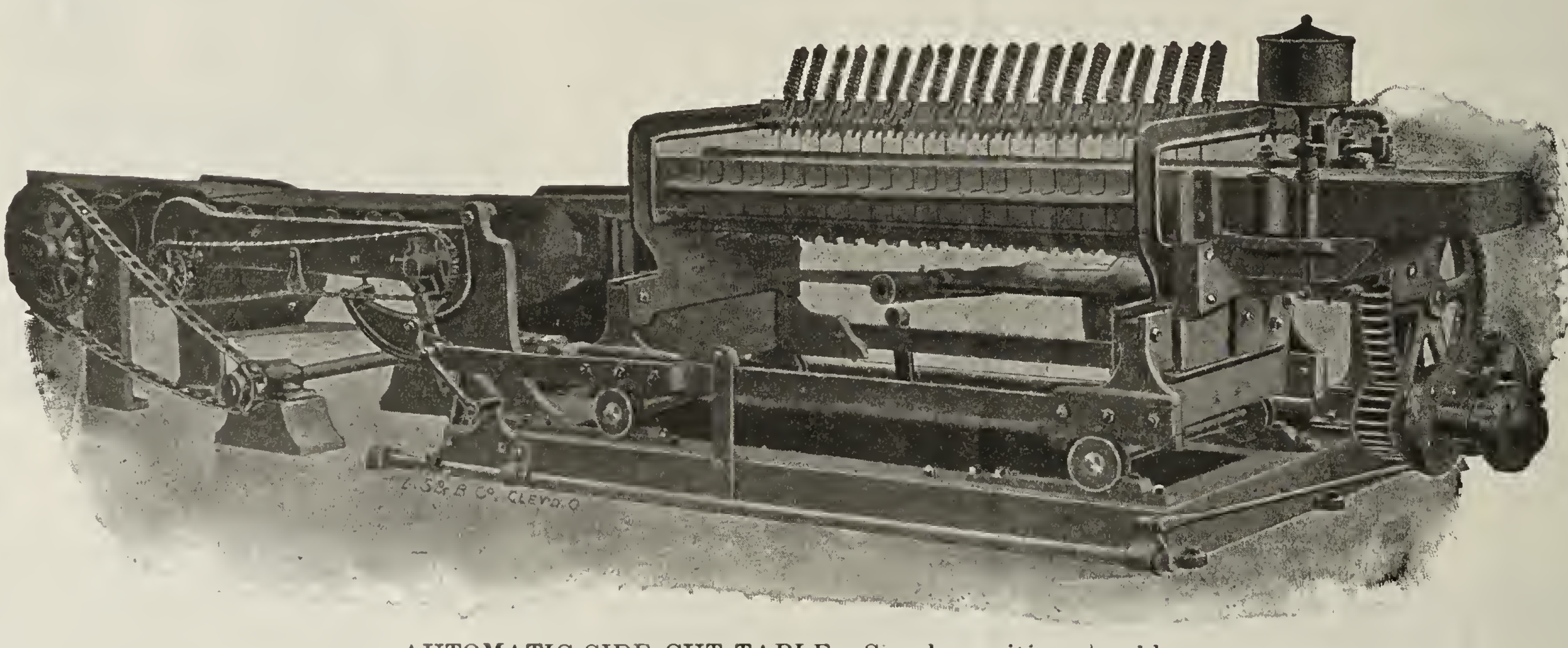
Raymond Machinery
Creates New
Business for the User
Better Brick
and more of them.

CATALOGUE

Modern Brick Machinery



SPECIAL COMBINED BRICK MACHINE AND PUG MILL 100,000 daily capacity.
AUGER BRICK MACHINES 10,000 to 100,000 capacity, five sizes.



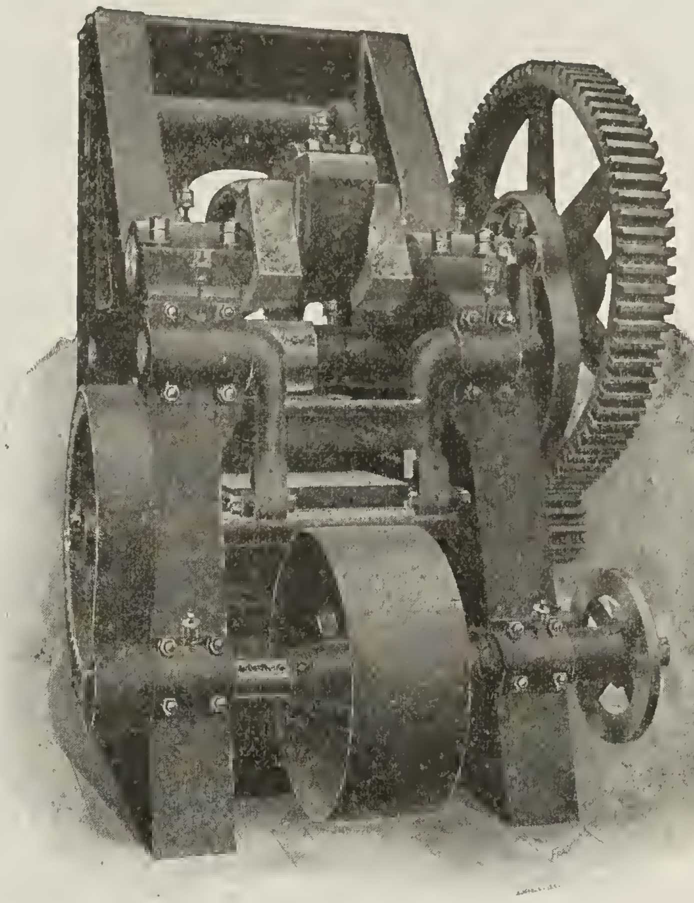
AUTOMATIC SIDE CUT TABLE. Simple, positive, durable.

COMPLETE EQUIPMENTS FOR BRICKMAKERS. *ASK FOR CATALOGUE.*

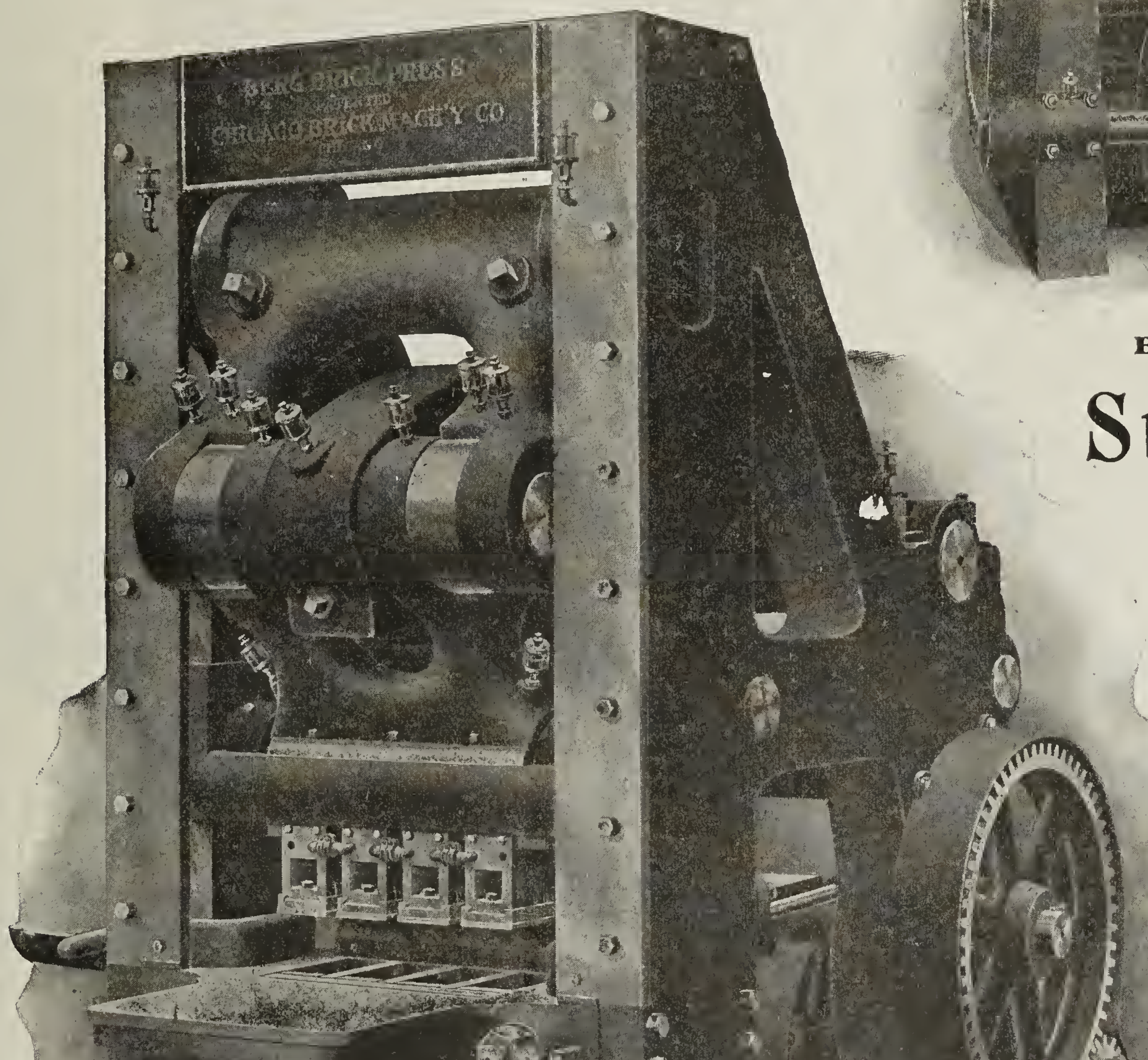
THE BONNOT COMPANY, Canton, Ohio.

—WESTERN AGENTS—
CHICAGO BRICK MACHINERY CO., - - 77 Jackson Boulevard, Chicago, Ill.

NEW MODEL
BERG BRICK PRESS



Back View.



Still in the Lead

AND

One Step Further Forward

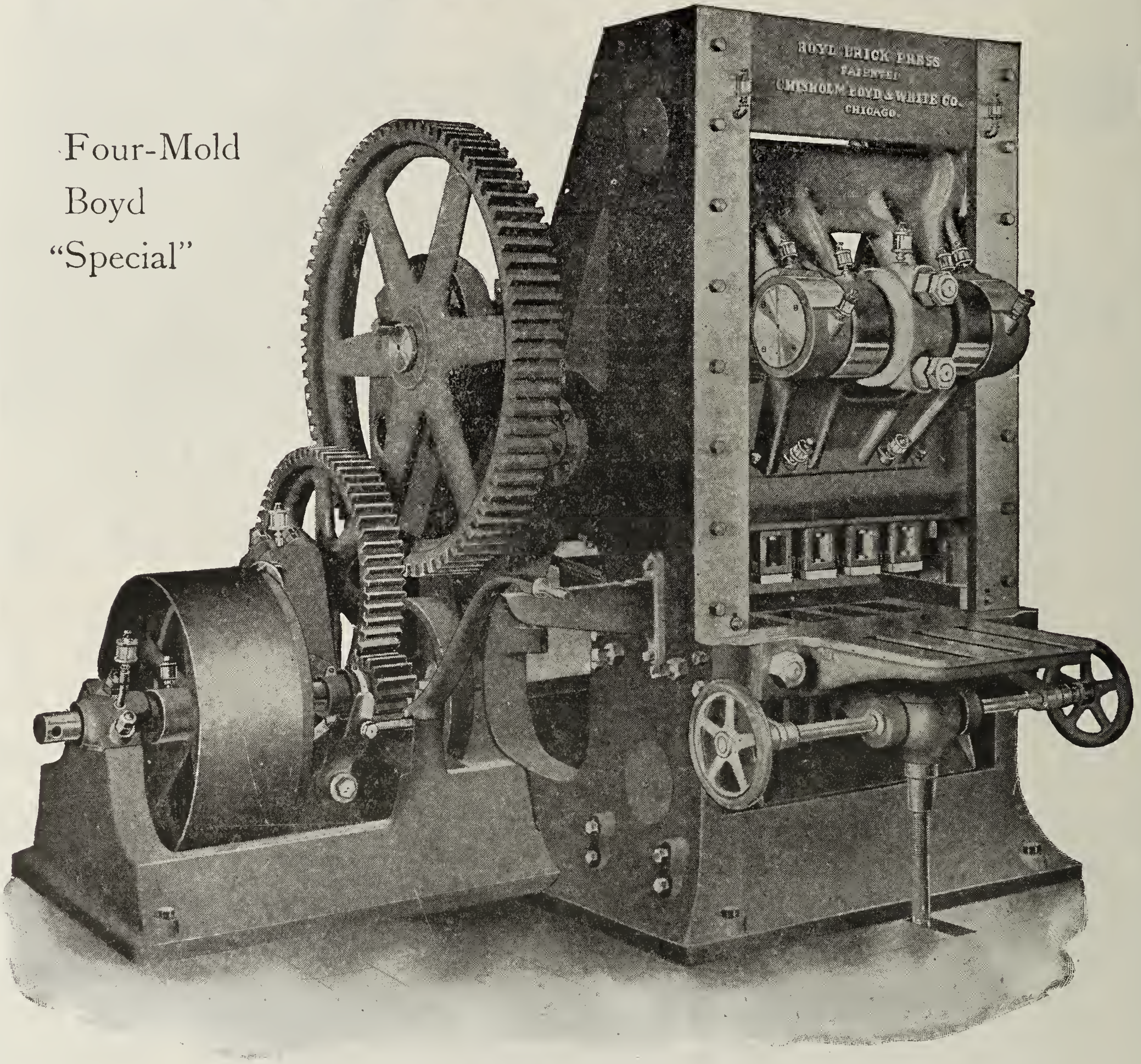
Even stronger than ever and all self-contained. Greater pressure and fewer working parts than any other machine. Simple, massive, compact. Running mechanism placed in rear, as shown in upper cut, enabling this machine to be SHIPPED IN ONE PIECE.

MANUFACTURED BY
ANDERSON FOUNDRY & MACHINE WORKS
Anderson, Indiana.

SOLD BY
CHICAGO BRICK MACHINERY COMPANY
77 Jackson Boulevard, Chicago.

The Boyd Brick Press

Four-Mold
Boyd
"Special"



A Business Proposition.

We will send to any responsible party a **BOYD BRICK PRESS ON TRIAL** and subject to purchase after the making and burning of one or more kilns of brick. We take the machine back if not satisfactory.

THE BOYD BRICK PRESS exerts greater pressure, holds it longer, puts more clay into brick, and makes stronger brick than any other Brick Press made. Especially adapted for working shales, and is the only successful machine for making fire brick.

ALL BOYD PRESSES are fitted with our IMPROVED PATENTED MOLD BOX, the liners of which are made of the hardest and toughest known metal, which can be reground at low cost when worn. The molds can be changed in a few minutes.

ITS RECORD: More Boyd Presses in actual operation than of all other Press Brick Machines combined. Write for General Catalogue No. 10.

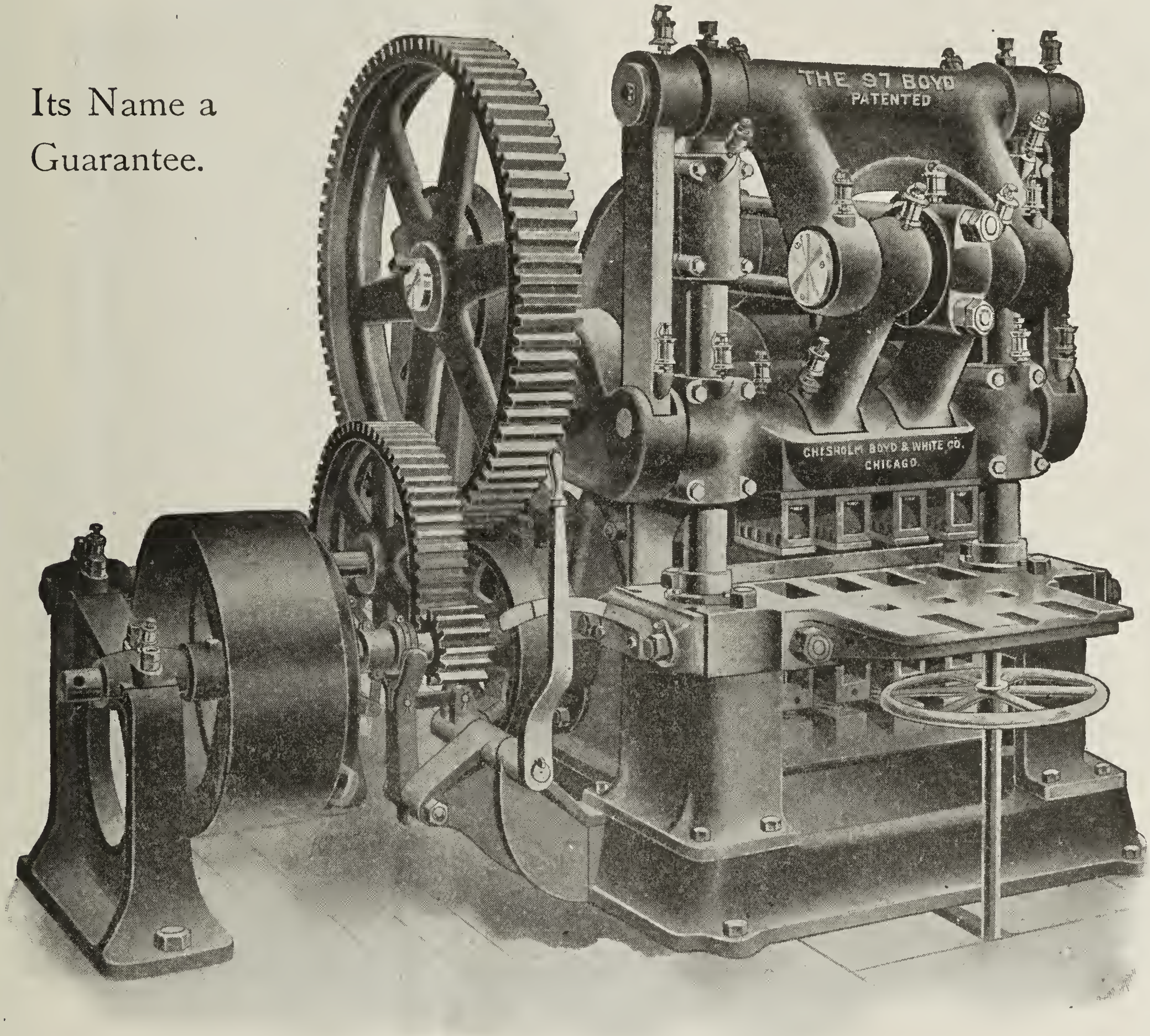
Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

The Boyd Brick Press

The '97 Model

Its Name a
Guarantee.



THE '97 MODEL BOYD BRICK PRESS has enormous strength and great durability; it is compact; the adjustments are convenient; it operates quietly and smoothly; the workmanship and material are of the best; the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking.

THE BOYD is the only Brick Press provided with an independent adjusting device for regulating the amount of clay in the molds and the pressure on the brick. This feature positively ensures equal pressure and finish on both sides of the brick, and no granulated or soft centers.

Sent on trial and fully guaranteed. Seventy presses of this pattern now in use. Cannot be broken in pressing brick. Write for descriptive catalogue No. 9.

Chisholm, Boyd & White Company

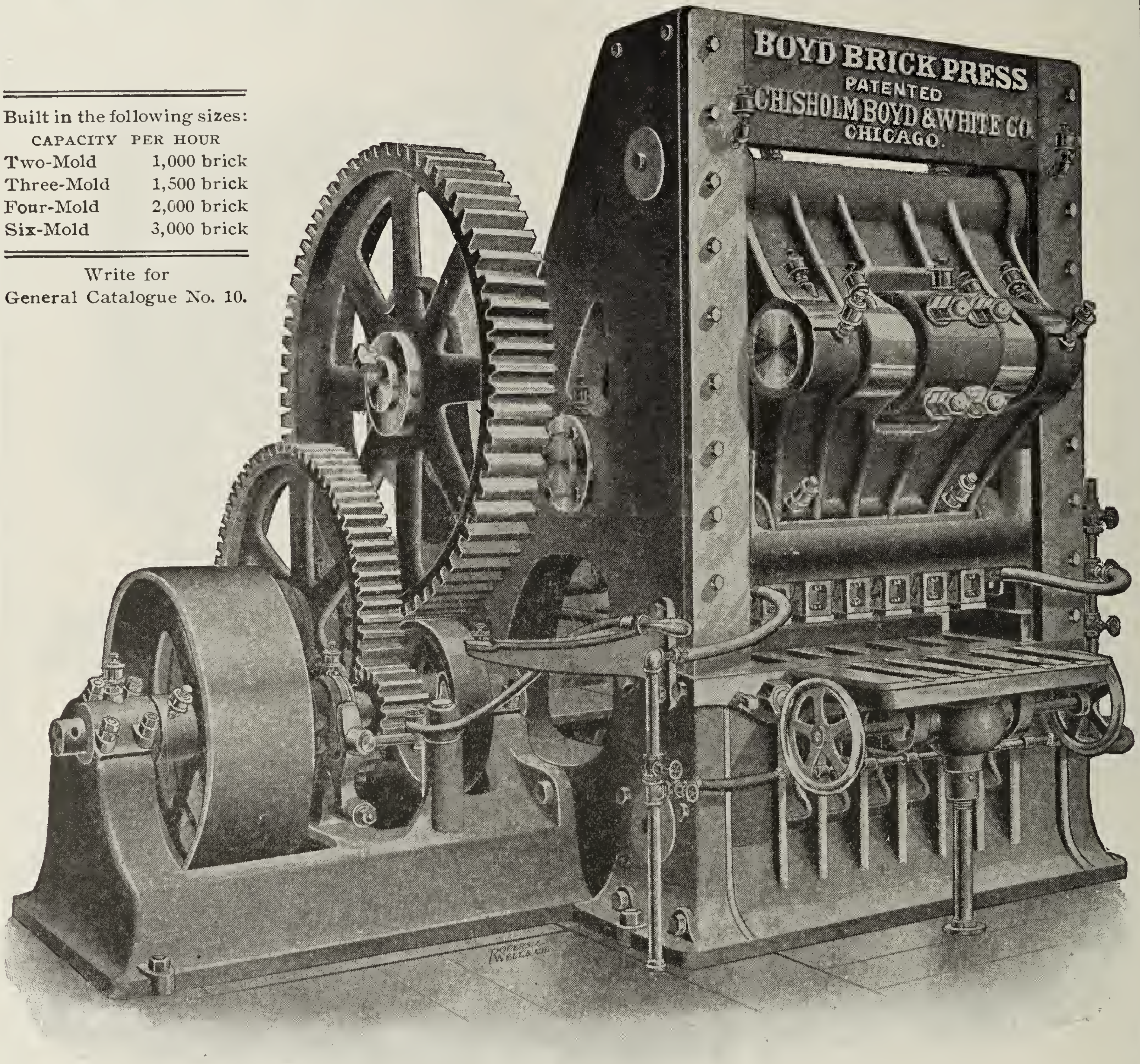
Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

The Boyd Brick Press

Built in the following sizes:

CAPACITY	PER HOUR
Two-Mold	1,000 brick
Three-Mold	1,500 brick
Four-Mold	2,000 brick
Six-Mold	3,000 brick

Write for
General Catalogue No. 10.



Another Record for the Boyd Press:

Six of our SIX-MOLD PRESSES in use on ONE YARD since 1892. Average cost of repairs for each machine One Dollar per year.

THE BOYD PRESS has always been distinguished for originality in design and construction. It will make better brick from clay or shale than can be made from the same material by any other press. It is selected and purchased by the most progressive Brick Makers. The largest and most successful brick plants in the country are using Boyd Presses.

Chisholm, Boyd & White Company

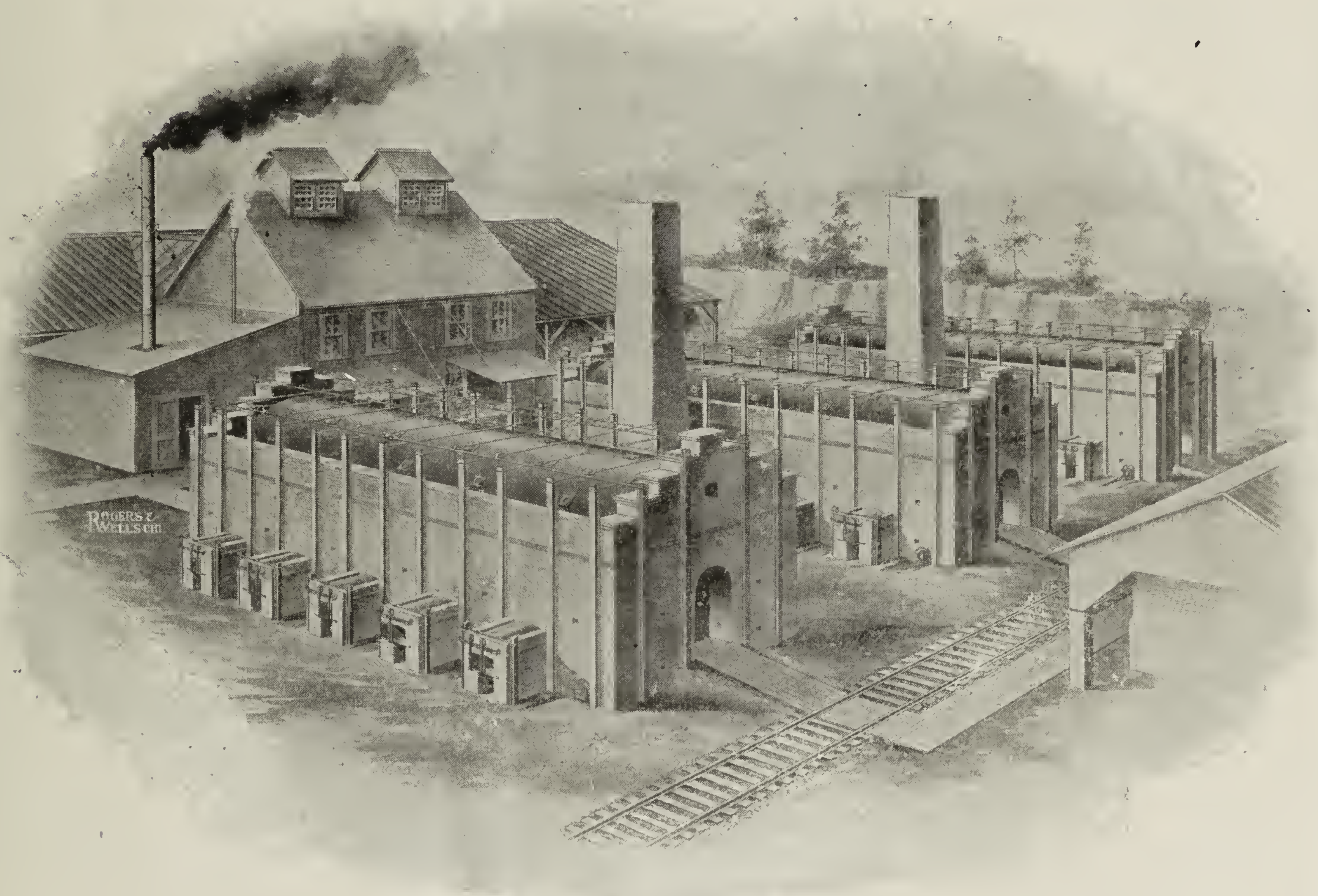
Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

Chisholm, Boyd & White Company

Engineers and Contractors for Brick Plants.

MANUFACTURERS OF

The Boyd Brick Press


ROGERS & WELLS CH.

A MODERN BRICK PLANT—As Equipped by us.

A Sure Thing—We design, construct and equip Brick Plants of any desired capacity, furnishing the brickmaking machinery and power plant, erect the necessary buildings and kilns, and turn the plant over to the purchaser in proper working order, under guarantee of satisfactory results.

Brick Plants designed and equipped by us have the highest reputation for efficiency. They are modern, up-to-date, compact, convenient in arrangement, and are not encumbered with unnecessary or useless machinery or appliances.

CORRESPONDENCE SOLICITED.

Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

Adopted and Purchased by the United States Government for use in the Federal Prison at Ft. Leavenworth, Kansas.

Ross-Keller Triple Pressure Brick Machine Co.

SOLE MANUFACTURERS OF THE

"ROSS-KELLER" TRIPLE PRESSURE BRICK MACHINE
"ROSS-KELLER" 44-INCH DISINTEGRATOR

OFFICES:
FULLERTON BUILDING

THIS PRESS HAS AN UNEQUALLED RECORD IN THE MANUFACTURE OF SAND-LIME BRICK.

St. Louis, Mo., U S. A., March 15th, 1905.

ANNOUNCEMENT

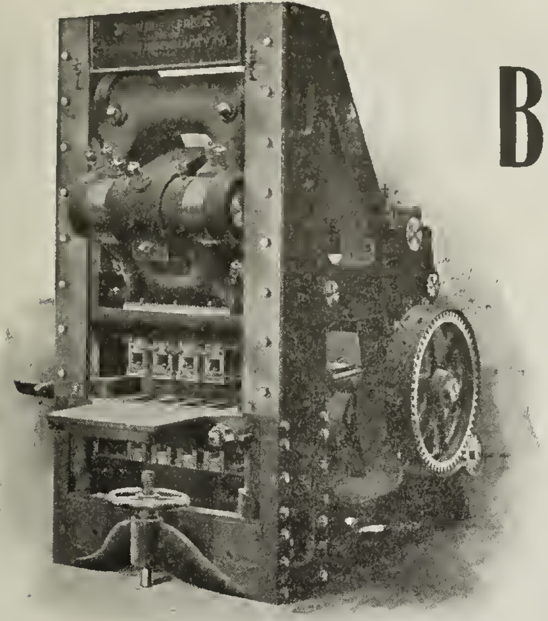
To meet the demand for a lighter ROSS KELLER Press than our Triple Pressure Standard Machine, we have designed and are now building a high-grade four-mould press, weight 30,000 pounds, which we recommend to the trade for clays and soft shales, which do not require as great a pressure as is secured in operating our Standard Machine

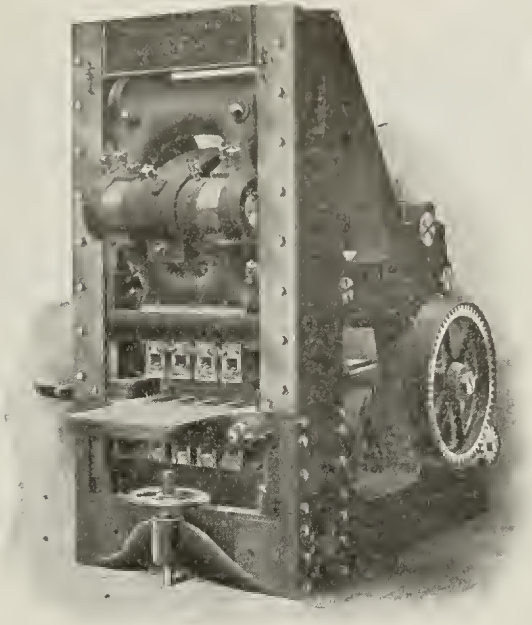
Our Standard Triple Pressure Machines (weight 42,000 pounds) are now being successfully operated on Clay, Shale, Sand Lime and Cement Brickyards, and lead all other Dry Presses on the market We have a number of these machines now in process of manufacture, and are in a position to make prompt deliveries.

We guarantee both types of machines to be strictly high-grade and are prepared to make satisfactory prices and terms to manufacturers who are in the market for a dry dress.

We invite correspondence.

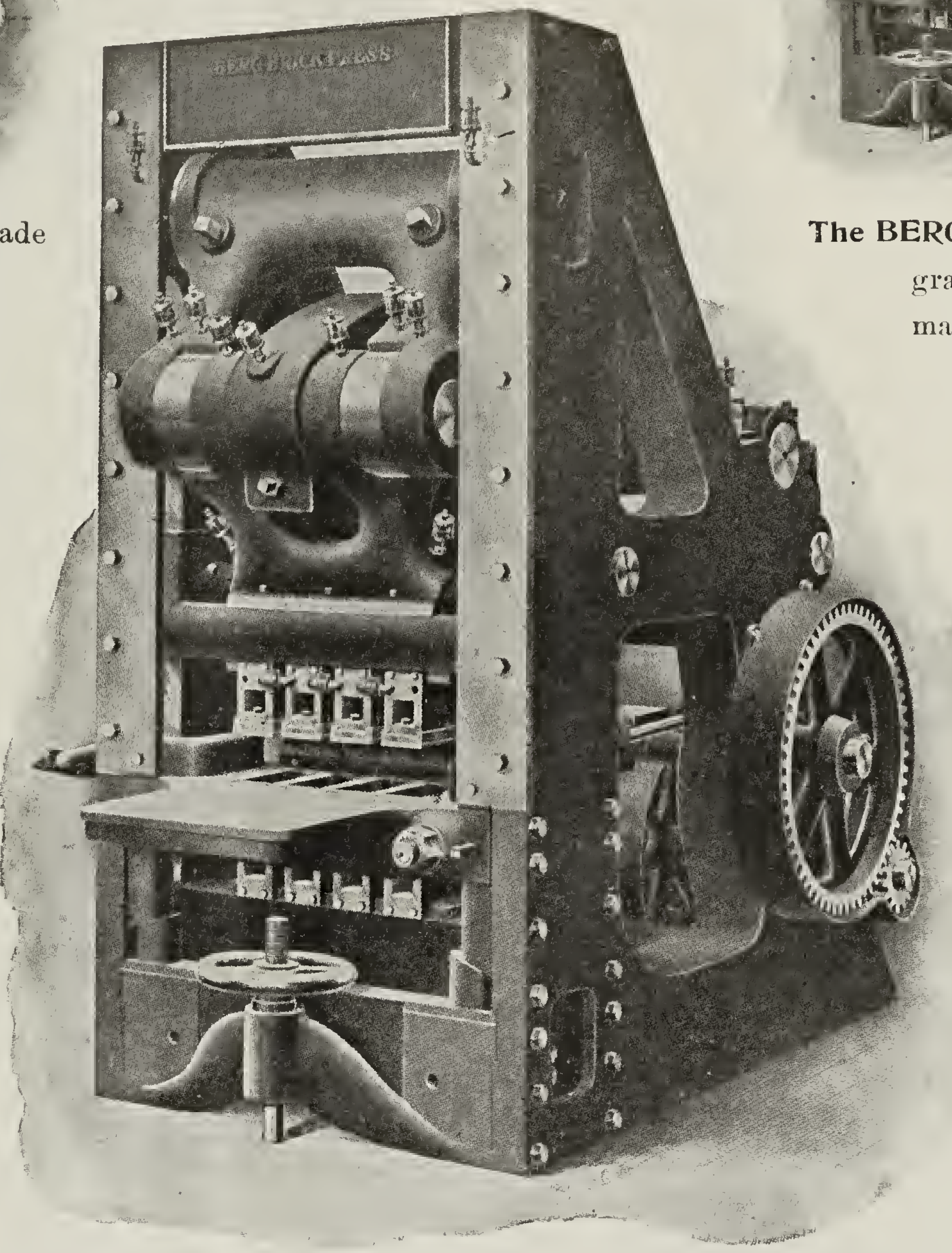
Ross-Keller Triple Pressure Brick Machine Co.
FULLERTON BUILDING, ST. LOUIS, MO





BERG BRICK PRESS

The highest development of the
Art of Brickmaking Machinery
so pronounced by the United
States Government.



The BERG for the highest grade of pressed brick of shale or clay. It makes all kinds of shapes and sizes of brick. Changes from one shape to another can be made in less than an hour's time.

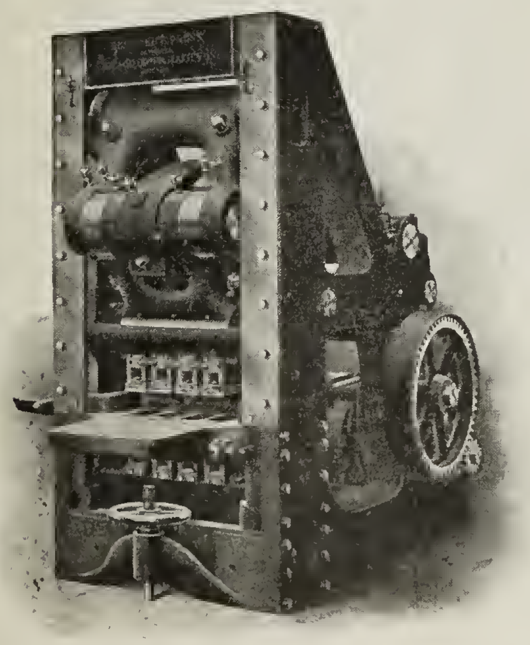
First-Class Workmanship. Cut Gearing. Fully Warranted.

The BERG makes the best sand-lime brick and cheapest because it is the strongest machine and gives the highest pressure. Thirty-five sand-lime plants in United States use the **BERG** Brick Press SUCCESSFULLY.

The BERG MAKES the highest grade of fire brick. Can make all kinds of shapes desired for fire-brick purposes.

Three distinct pressures make the brick evenly pressed all through. No granulated centers of the brick.

The BERG is the best for sand and cement because of its strong pressure. Uses less cement, makes cheaper brick.

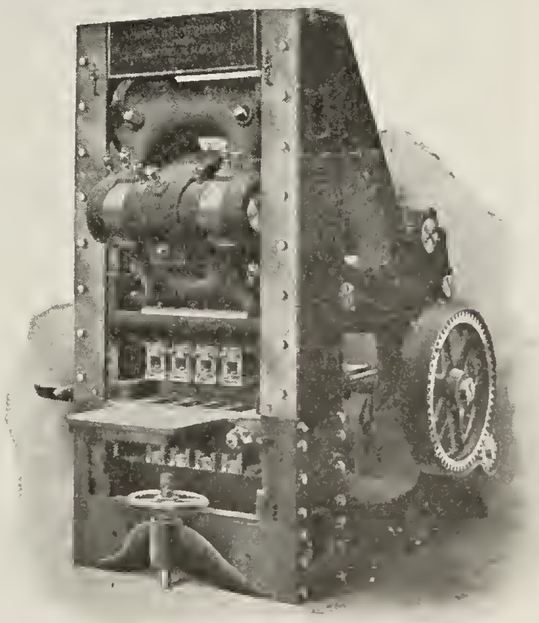


The 1905 Berg Press

Many other steps further forward in improvement and highest grade of material and workmanship, also cut gearing. Fully guaranteed as to its success. Manufactured by its inventor in Toronto, Canada, at the Bertram Engine Works Co. Plans and specifications on the different kinds of plants furnished, also all equipments.

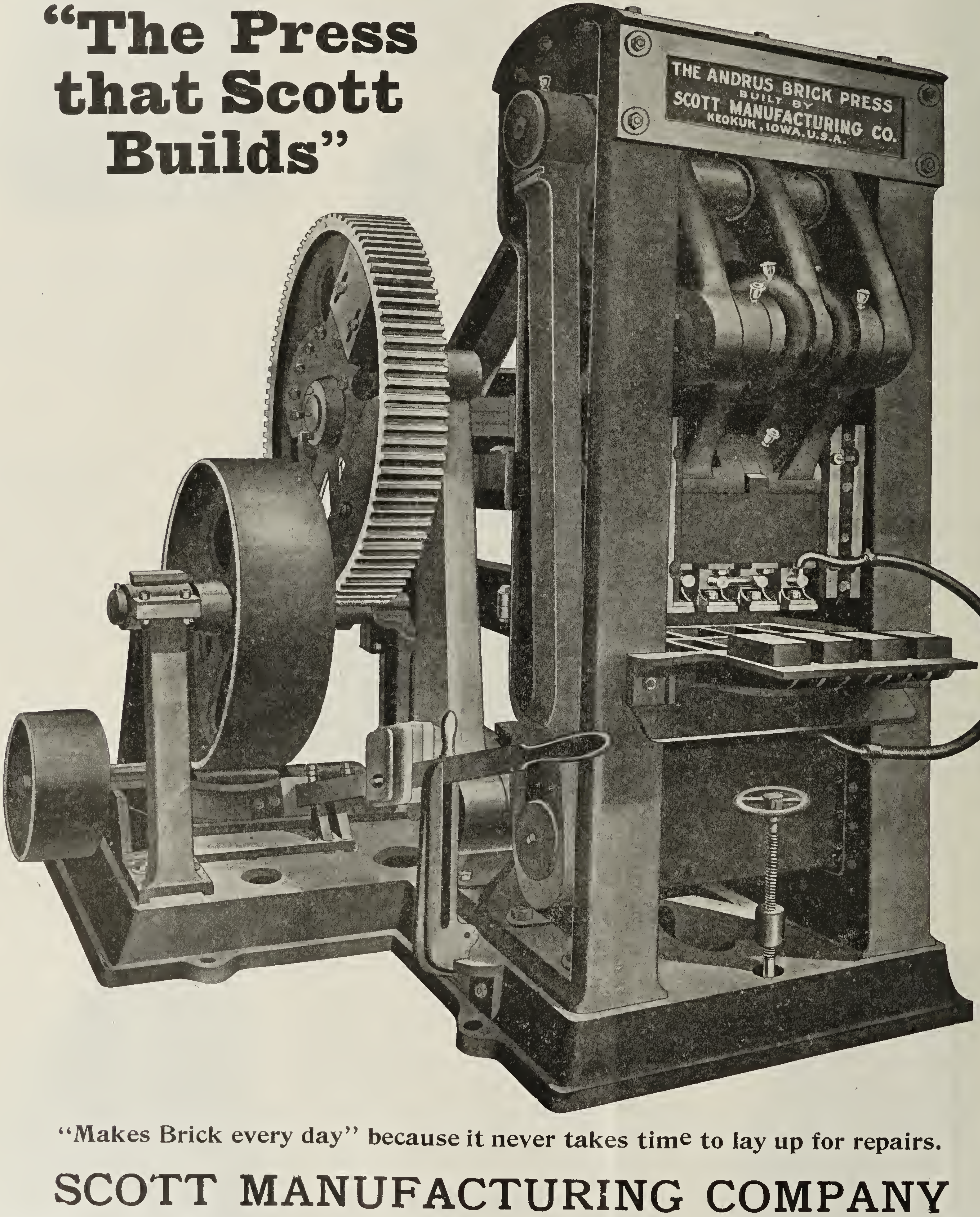
For prices and full particulars, address

A. BERG
THE BERTRAM ENGINE WORKS
Toronto, Ontario, Canada



One Glance Ought to Convince You

"The Press that Scott Builds"



"Makes Brick every day" because it never takes time to lay up for repairs.

SCOTT MANUFACTURING COMPANY

Works: Keokuk, Iowa. *ST. LOUIS, MO.*

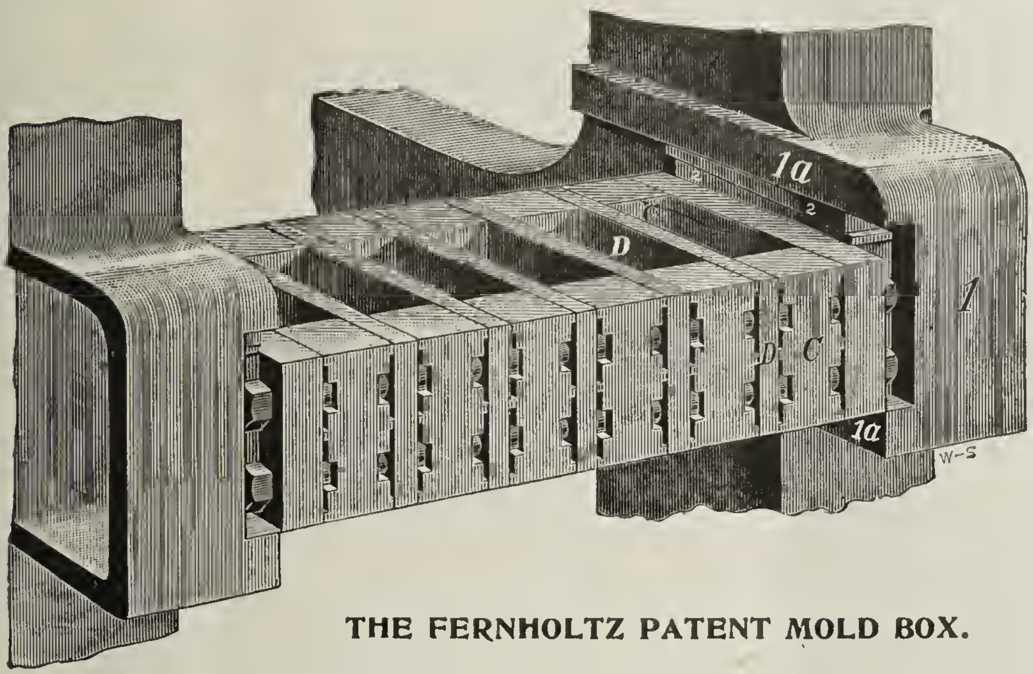
Call and see us in our new office, 609-610 Commonwealth Trust Building.

The Fernholtz Brick Machinery Co.

Manufacturers of

The Celebrated Fernholtz Dry Press

Four mold Press 20,000 daily capacity. Six mold Press 30,000 daily capacity

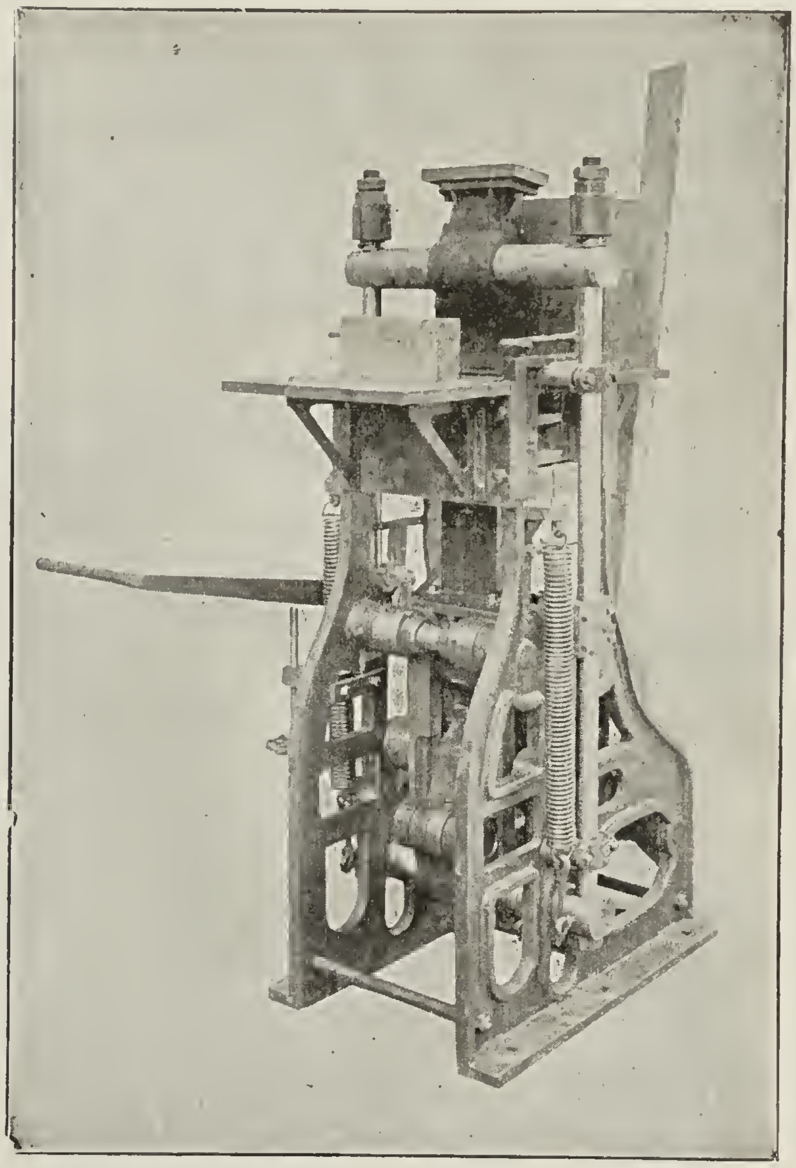


THE FERNHOLTZ PATENT MOLD BOX.

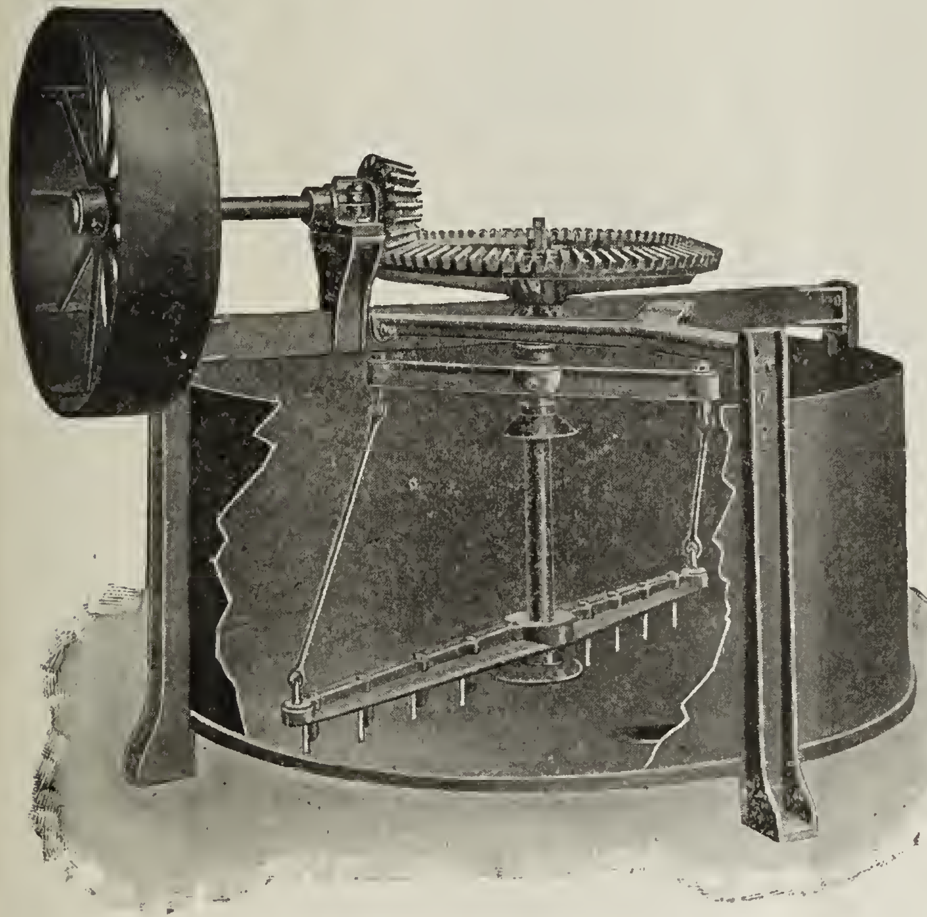
No old style Liners. The Blocks are adjustable and molds are always one size. We have put them in most all makes of Dry Press machines. Easily and quickly adjusted. They are made entirely out of chilled iron, the hardest known metal.

GRATH PATENT HAND POWER PRESS.

Especially adapted for ornamental designs. Any size brick up to 12⅝ inches long, 10 inches wide and 4¼ inches thick.
Brick set into kiln direct from press.



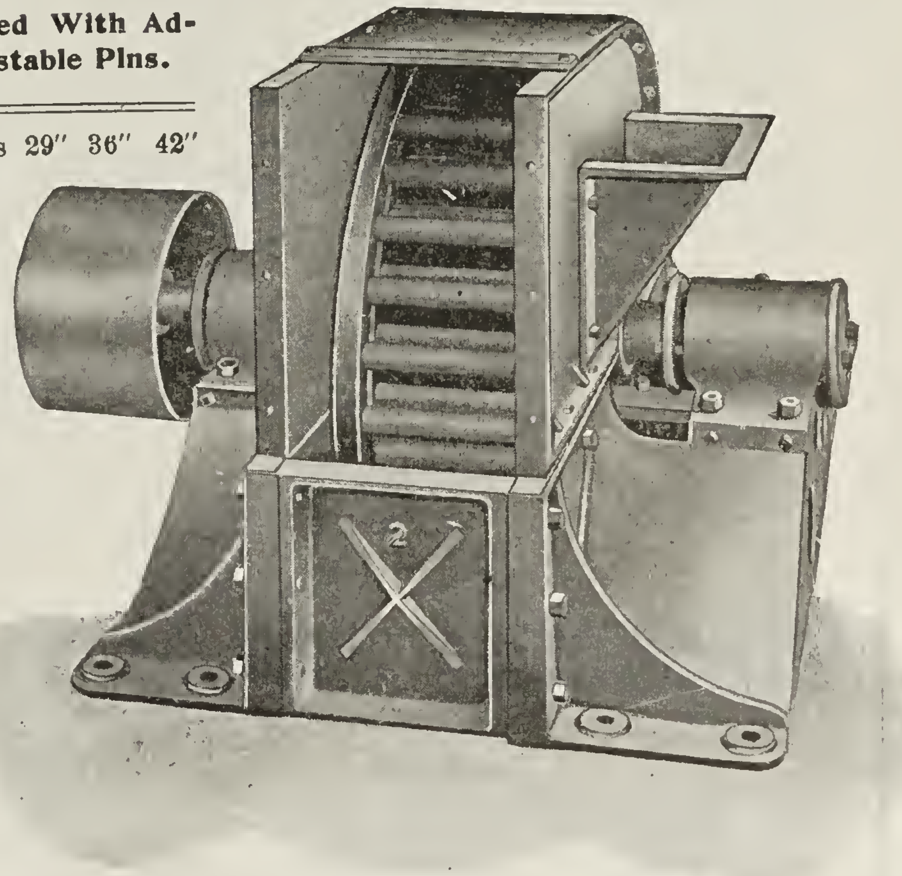
GRATH PATENT HAND POWER PRESS.



A GOOD MIXER IS ALWAYS APPRECIATED.

Fitted With Adjustable Pins.

Sizes 29″ 36″ 42″



THE FERNHOLTZ CLAY PULVERIZER.

The Fernholtz Brick Machinery Co.

Cable Address "Fernbrick." Western Union Code.

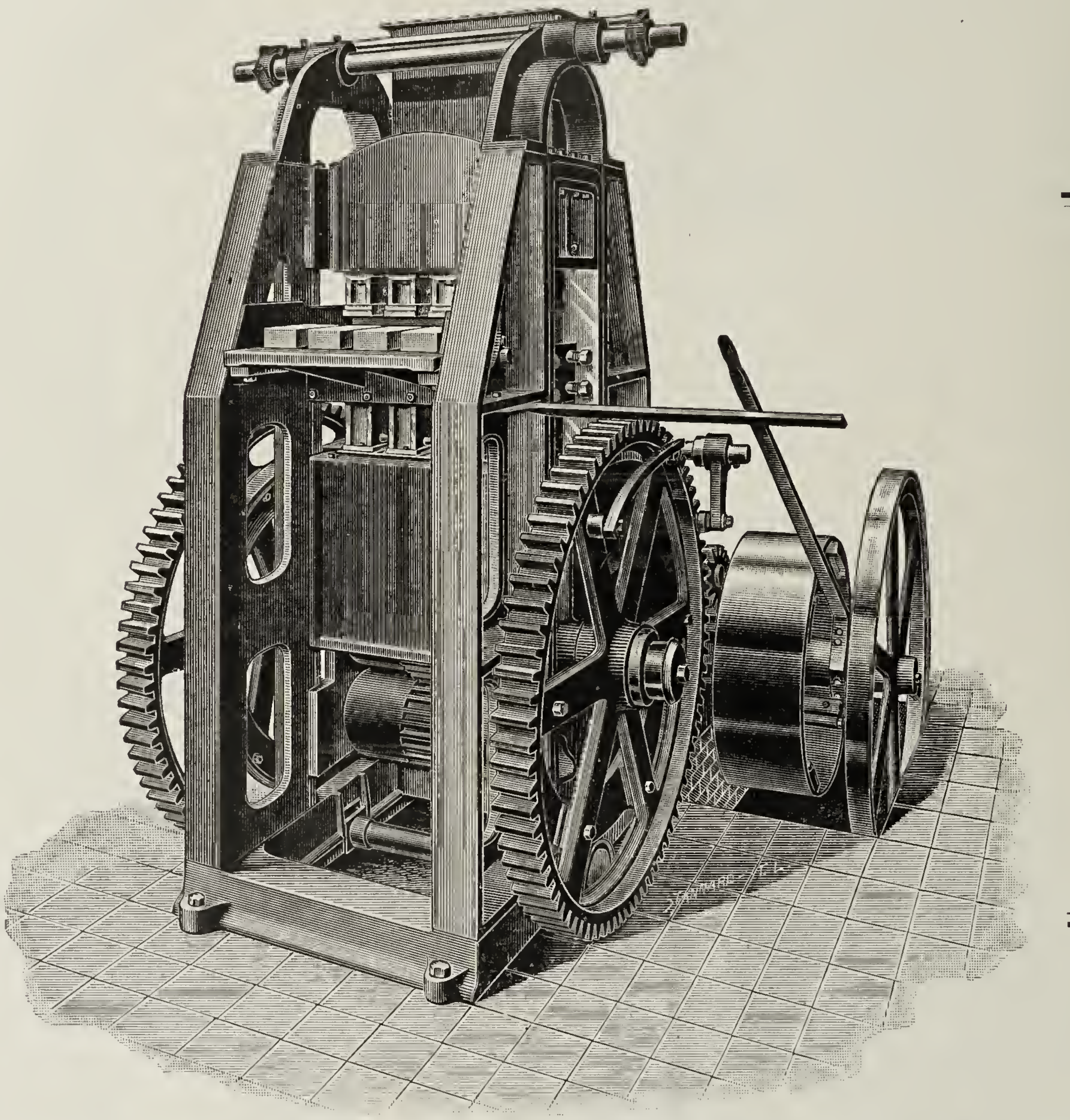
Boyle Avenue and Old Manchester Road, ST. LOUIS, MO., U. S. A.

PERFECTION REALIZED

IN THE

RELIANCE DRY PRESS BRICK MACHINE

(PATENTED)



Main
Features:
Strength
Durability
Simplicity
Saves Fuel
and
Costs Less

No
Toggles
No
Links
No
Pins
to
Wear

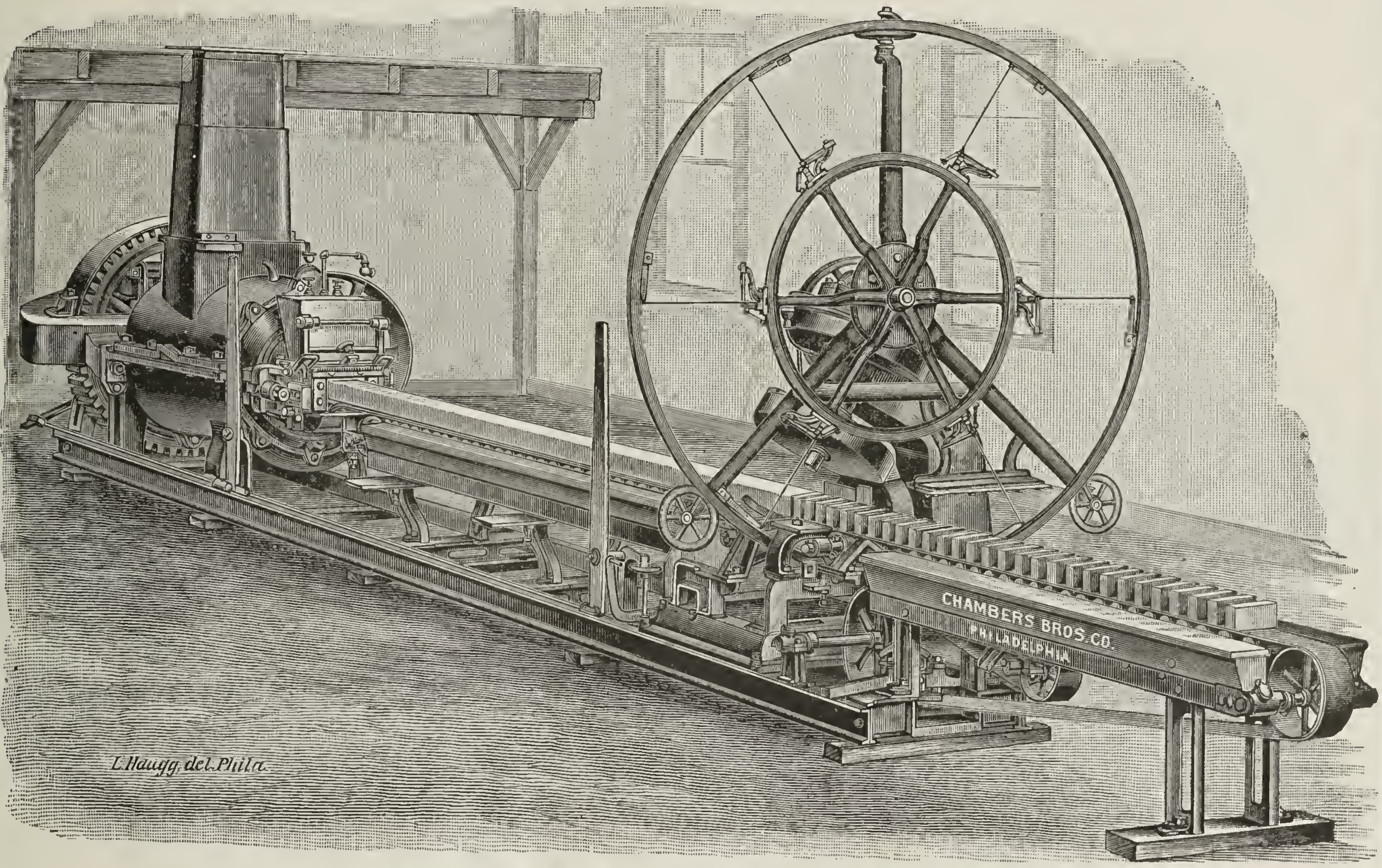
STRONGEST AND MOST POWERFUL BRICK PRESS ON THE MARKET

FOR PRICES AND FURTHER PARTICULARS ADDRESS THE

RELIANCE MACHINE AND TOOL WORKS
ST. LOUIS, MO.

MACHINERY FOR BUILDING BRICK
AND FOR STREET PAVERS

ROUND CORNER PAVING BRICK WITHOUT REPRESSING


CHAMBERS BROS. CO.
PHILADELPHIA
L. Haugg, del. Phila.

THE CHAMBERS AUTOMATIC SIDE-CUT BRICK MACHINE.

Automatic End Cut Brick Machines of five sizes, having capacity from 10,000 to over 100,000 brick daily under favorable conditions.

CHAMBERS BROTHERS COMPANY

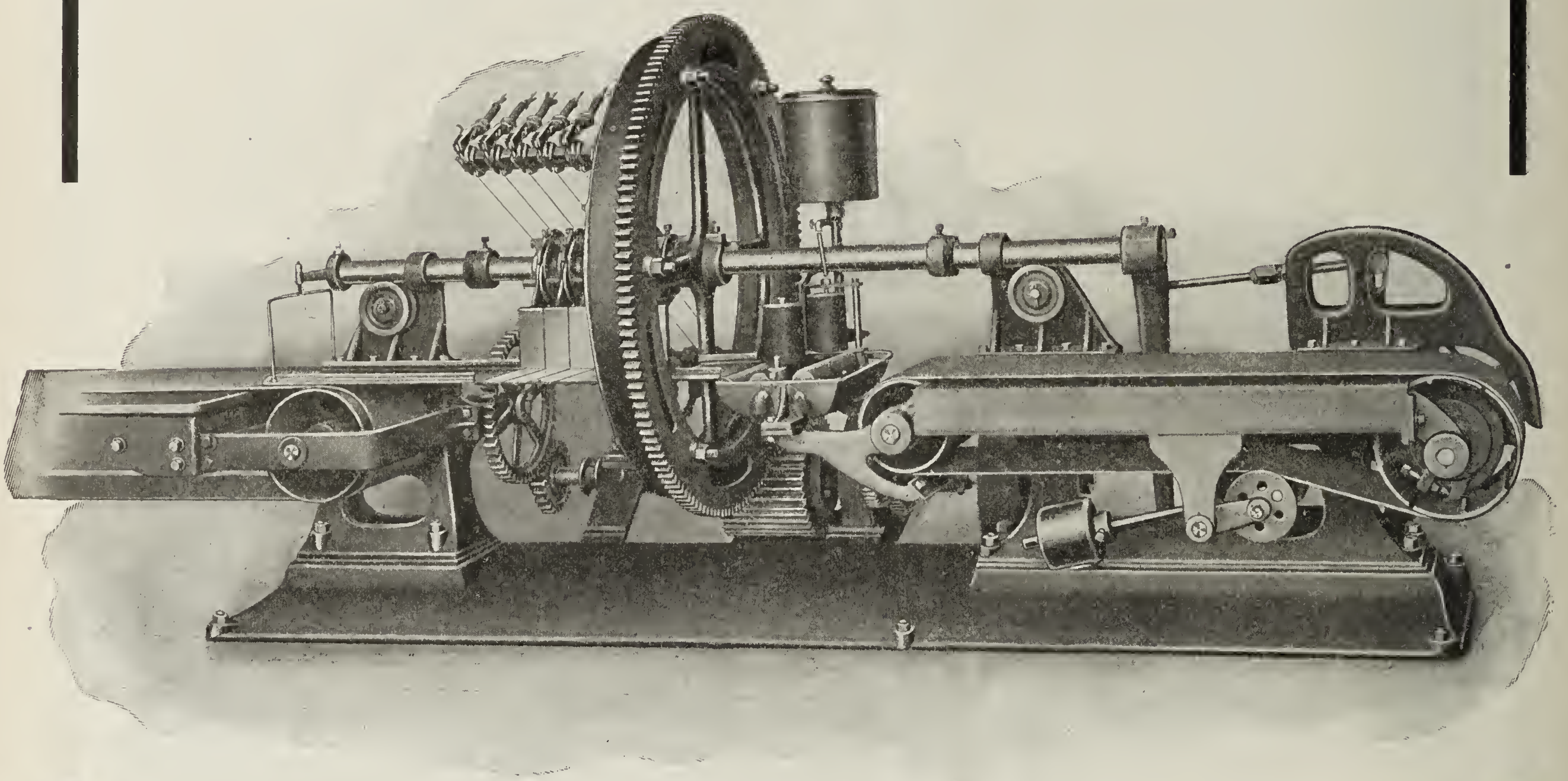
52D AND MEDIA STREETS
PHILADELPHIA, PA.

E. R. FRAZIER, Chicago Agent,
59 West Jackson Boulevard.

REVOLUTION IN

Automatic Cutters

Simple, Accurate, Light Running, Continuous Motion,
Perfect Brick.



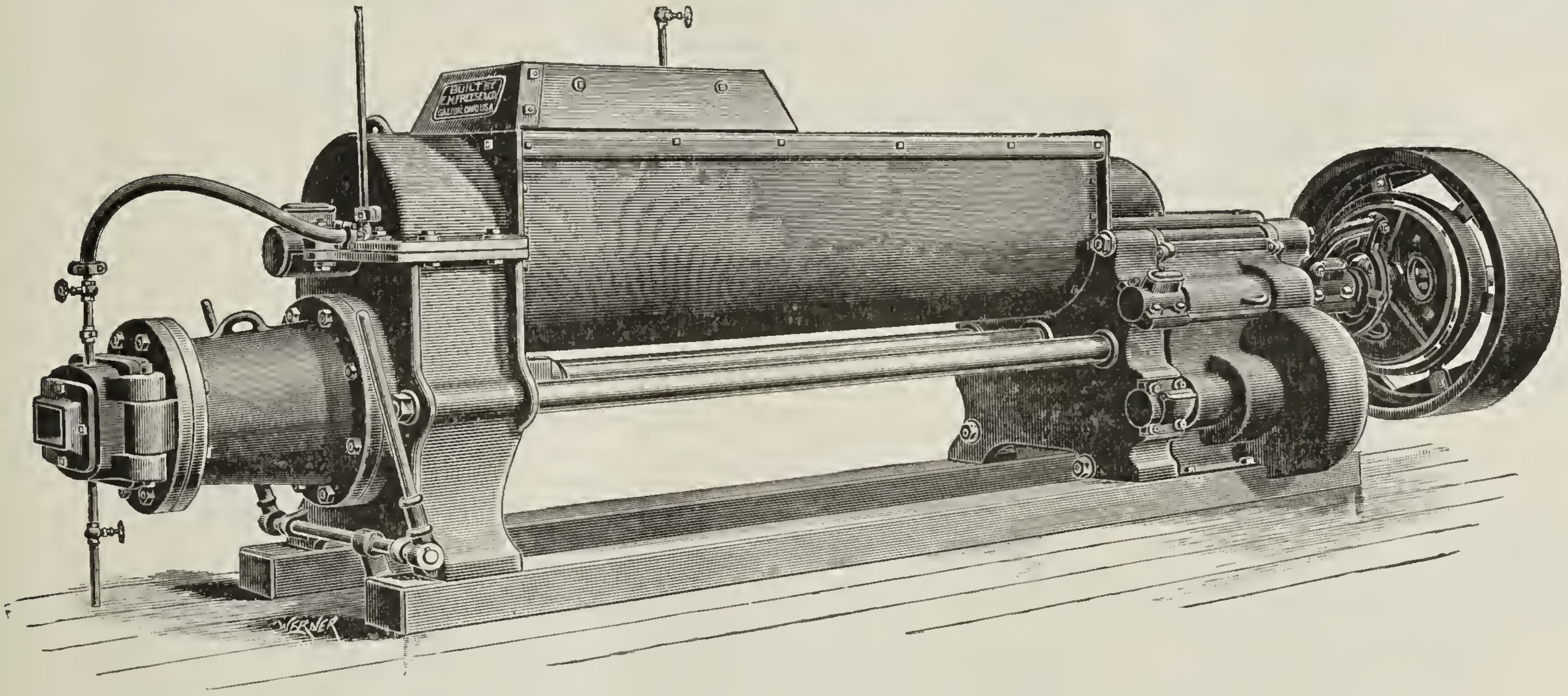
No. 25 Automatic Side Cut Brick Cutter.

THERE has never been introduced to the trade such a combination of excellent features, simplicity, accuracy and durability, as those embodied in our No. 25 Cutter. This cutter is beyond doubt the biggest value in cutters on the market today. Send for complete description. Our new catalogue is ready for distribution. If you haven't a copy send for one. It gives full information regarding our complete line of Dry Press, Stiff Mud and Soft Mud Brick Machinery, Roofing Tile Machinery, Sewer Pipe Machinery, Sand Lime Brick Machinery, Cement Machinery, Waste Heat. Steam and Hot Air Dryers and every appliance used in the clay trade.

The American Clay Machinery Co.

BUCYRUS, OHIO, U. S. A.

UNION BRICK MACHINES


BUILT BY
E.M.FREESE & CO.
GALION, OHIO U.S.A.
WERNER

We build these Machines in five sizes. Capacities to 10,000 brick per hour.

Several hundred are in everyday use. They do first-class work and are convenient, economical and durable. This can be verified by investigation.

We also build Brick Machines with separate Pug Mill.

Don't forget our Automatic Cutters. **They give satisfaction.**

State your requirements and let us furnish particulars.

E. M. FREESE & CO.

GALION - - - - OHIO

LAMINATION is the source of more loss, more worry and more anxiety than all other troubles of a brickmaker

---

KENTON C READ, Pres. ANDY O'CONNELL, Vice Pres. and Gen'l Mgr C. M. MILLER, Sec.-Treas.

—THE—

C. M. Miller Mfg. and Mining Co. Inc.

MAKERS OF

High Grade Veneer and Building Brick

Office, 331 Ohio Street.

New Phone 1142.

Terre Haute, Ind. Dec. 22, *190*4.

Mr H. L Hix, Mgr
The Wallace Mfg Co, Frankfort, Ind.:

Dear Sir — I feel that I must tell you my experience with the brick made on the Intermediate Wonder:—

A few days ago a very prominent contractor asked me to bring him some samples of our brick. I fixed up some samples and started to his place, and just as soon as he saw them, he said: "I don't want them—they are no good; I would not lay one of that kind of brick," but I begged him to look at them and tell me why he did not want them. He asked me if he could break one of them, and I said, "Yes, break all of them" So he took his hammer and hit one on the corner; then he looked up at me and said: "I never saw a stiff mud brick like that;" then he broke it all up, just as nice as any brick, and he said: "That is the first stiff mud brick I ever saw without lamination," and that they were all right.

We are now selling our brick as fast as we can deliver them.

Pardon me for taking your time, and with SUCCESS to the WONDER, I am,

Yours very truly,

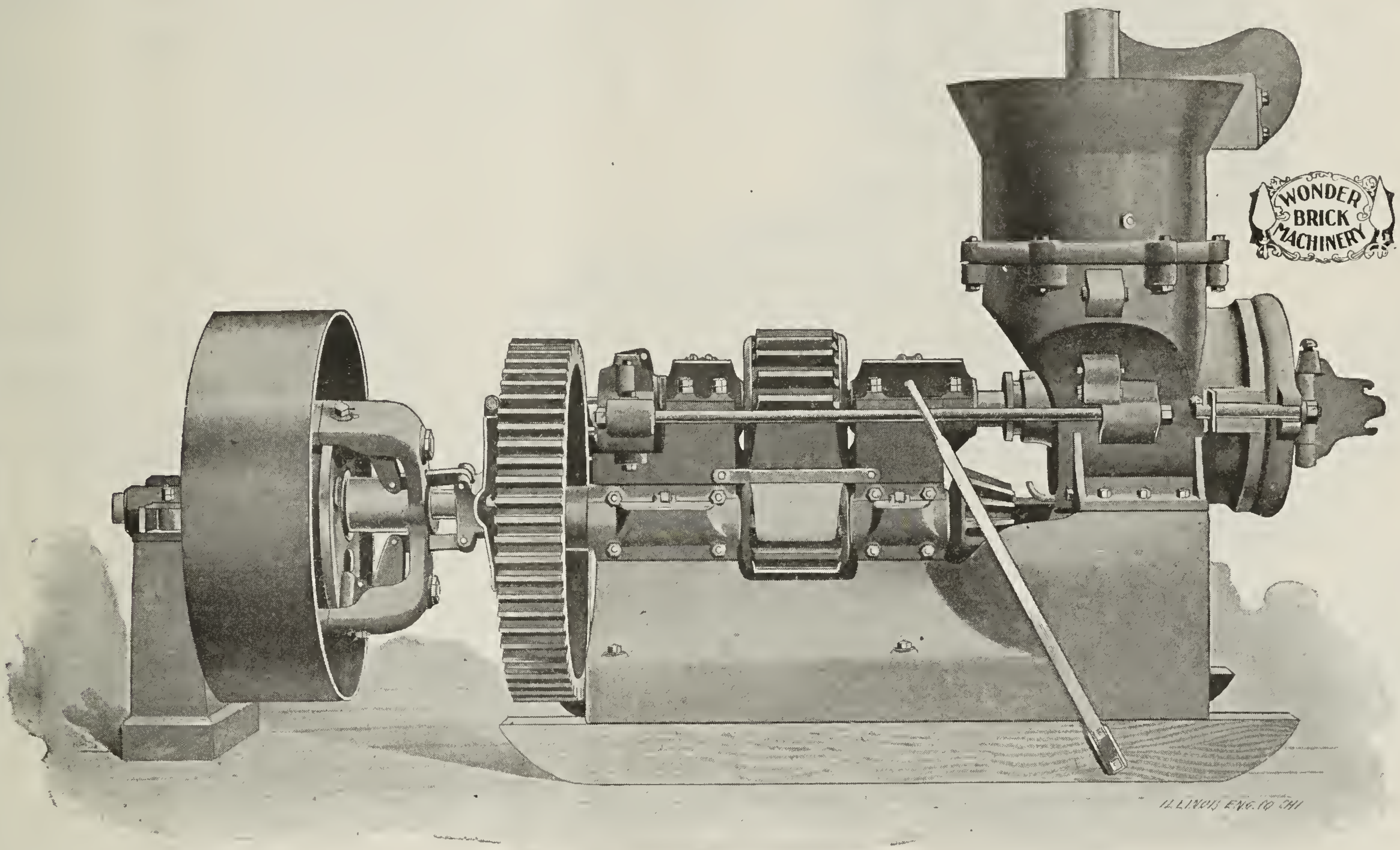
Andy O'Connell
V P and Gen Mgr.

In the event that you want to make brick filled with LAMINATION, CRACKS and CROOKS, a Wonder Machine will not answer your purpose.

THE WALLACE MFG. CO.

FRANKFORT, IND., U. S. A.

PRAISED BY EVERY USER



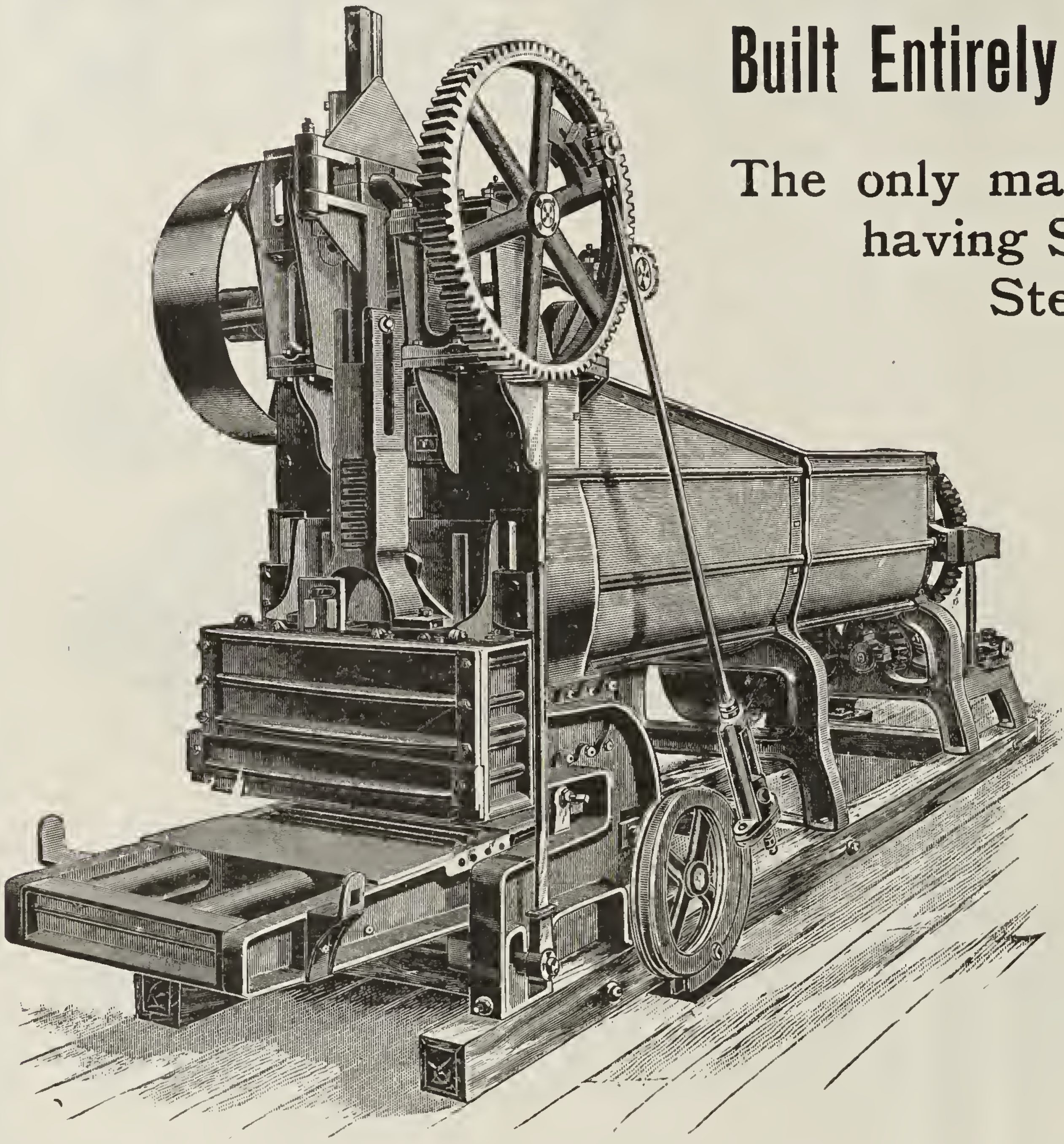
INTERMEDIATE WONDER.

40,000 daily capacity. Meets the requirements of the brickmakers.

The Wallace Mfg. Co.

FRANKFORT, IND., U. S. A.

THE POTTS
HORIZONTAL BRICK MACHINE



Built Entirely of Iron and Steel.

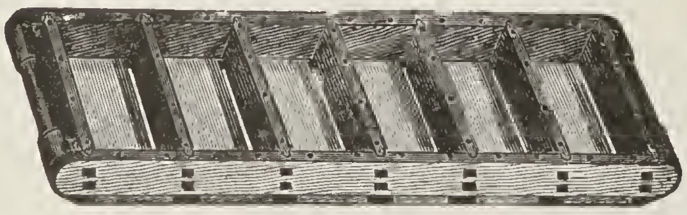
The only machine of this class having Steel Gear and Steel Shaft.

Built of the Best Material by the Best Workmen.

Simple, Strong and Durable.

No extra pug mill required to enable working the clay direct from the bank. Its great strength enables working the clay as stiff as practicable, insuring brick which will be STRAIGHT and SQUARE.

THE LEADER OF ALL SAND MOULD MACHINES.



BRICK MOULDS A SPECIALTY

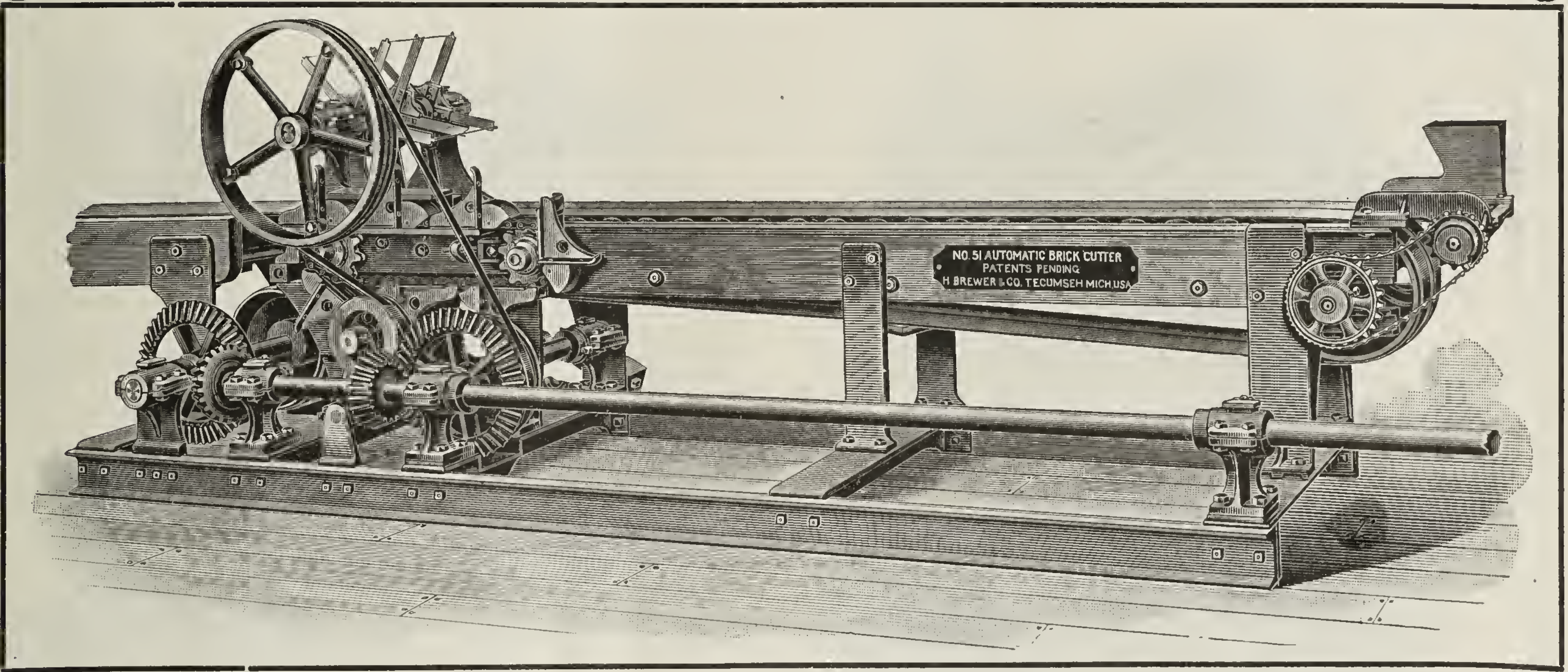
QUALITY IS OUR AIM.

We manufacture a complete line of Brick Yard Supplies. Write for prices.

C. & A. POTTS & CO., Indianapolis, Ind.

A NEW ONE

The New Brewer No. 51 Automatic Cutter for end-cut brick is now ready, having passed through all the practical tests which are necessary to develop a good machine. It cuts either single or double column ware, the former on edge or flat. It has an efficient sander, a perfect measuring device, and will cut as many or as few brick as the machine in front of which it is placed will make.


NO. 51 AUTOMATIC BRICK CUTTER
PATENTS PENDING
H BREWER & CO. TECUMSEH MICH.USA

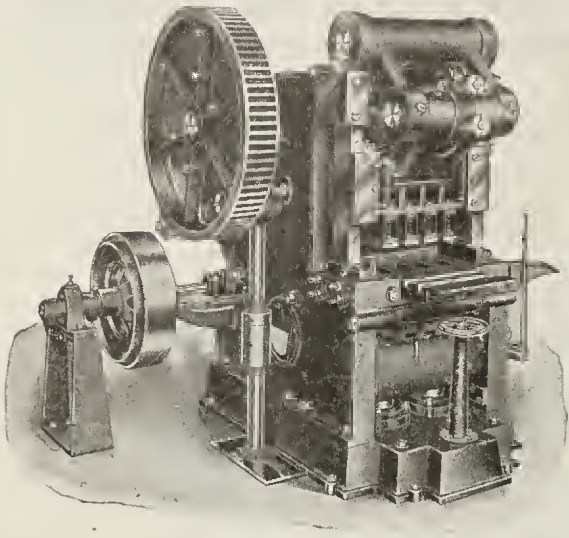
If interested in Automatic Cutters for side-cut or end-cut brick, drain tile or hollow blocks; if you want to investigate crushers, disintegrators or pug mills; if you would like to know about a line of combined brick and tile machines, including both large and small ones; or if you have anything special in the line of clay-working machinery which you would like to have put in practical shape, write

H. BREWER & CO., TECUMSEH, MICHIGAN.

Built Right
Run Right

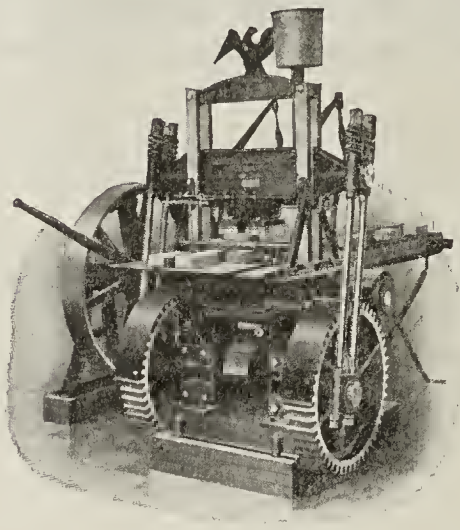
The American Clay Machinery

These are a few of the many Superior machines we manufacture for the Clay Trade. Large cuts



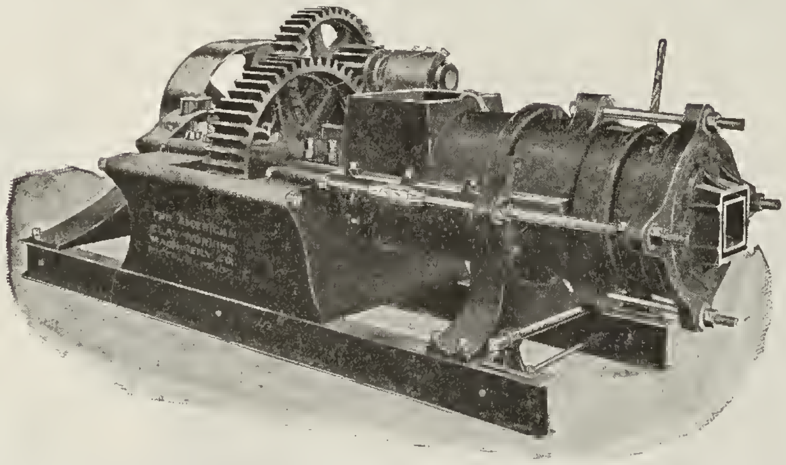
DRY PRESS BRICK MACHINERY.

We build a full line of Dry Press brick machinery. We have four styles, and eight sizes, ranging in capacity from 1,000 to 3,000 brick per hour. This cut is our four mold, Moldel B press, especially adapted to Sand-Lime brick. Write for complete catalogue.

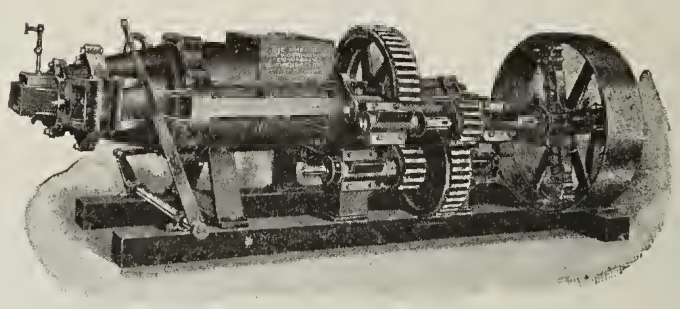


REPRESSES.

We build a large and complete line of represses in six sizes and styles. Capacity runs from 600 to 2,500 brick per hour. Send for our complete catalogue. This cut is of our double mold Eagle Repress.

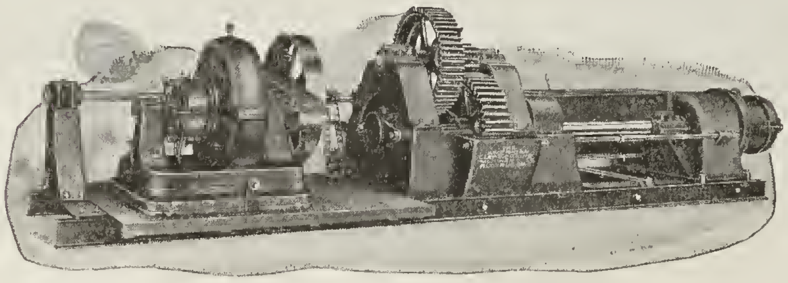


No. 40 AUGUR MACHINE FOR HOLLOW WARE.



No. 2 GIANT AUGER BRICK MACHINE.

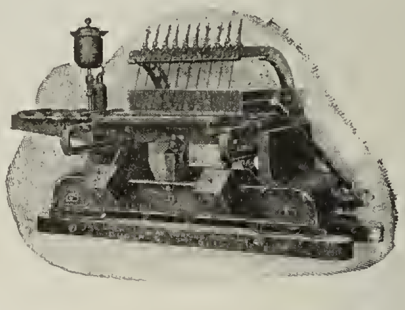
We build ten sizes and styles of Auger Machines. Capacities 1,500 to 10,000 brick per hour. Write for complete list.

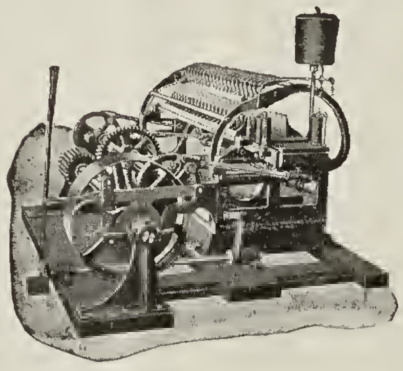


No. 23 ELECTRICAL DRIVEN, LOW FRAME, COMBINED MACHINE.

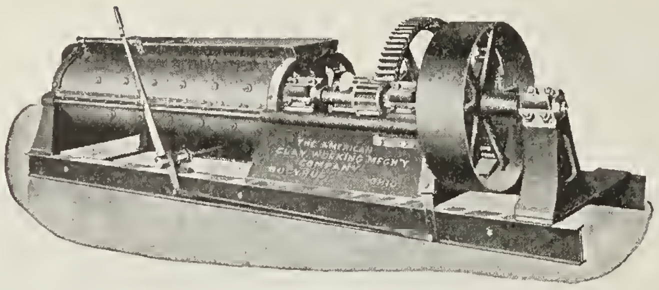
We make a full line of electrical driven clay-working machinery. Send for catalogue.

SEMI-AUTOMATIC AND HAND POWER CUTTERS





We make twenty-five styles of semi-automatic and hand power cutters for brick, tile and hollow ware. Write for full list and description.

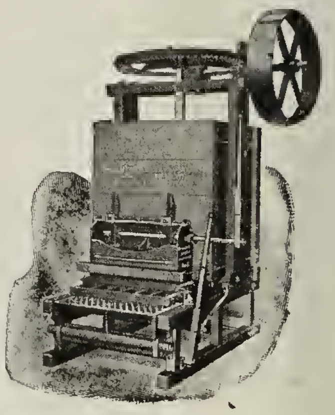


No. 38 DOUBLE SHAFT PUG MILL.

We build twenty different styles and sizes of pug mills to suit the needs of varying clays. Send for complete list and description.

SOFT MUD BRICK MACHINES.

Our Eagle Steam and Horse Power Brick Machines are the best built for small capacity. They are complete with molds, etc. Write for our soft mud booklet. These machines are especially adapted for export.



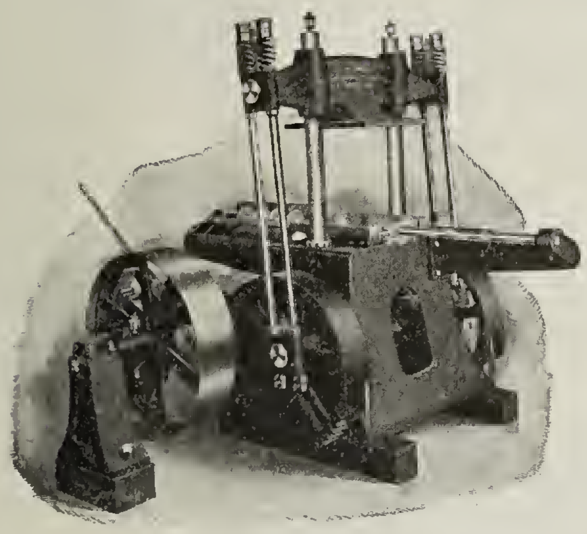
Built Right
Run Right

Dry Press, Stiff Mud and Soft Mud Brick Machinery. Sand-Lime Brick Machinery, Cement, and Pottery Machinery. Waste Heat and Steam Dryers
Everything needed by the Clay Workers.

Company, Bucyrus, Ohio, U. S. A.

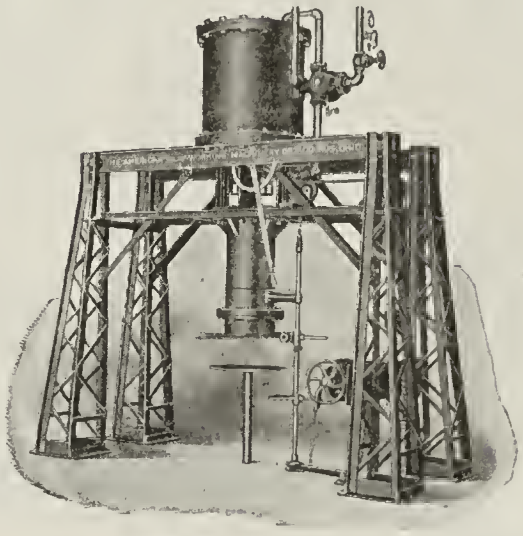
Built Right Run Right

and full descriptions of these and a hundred other machines we make will be sent upon request.



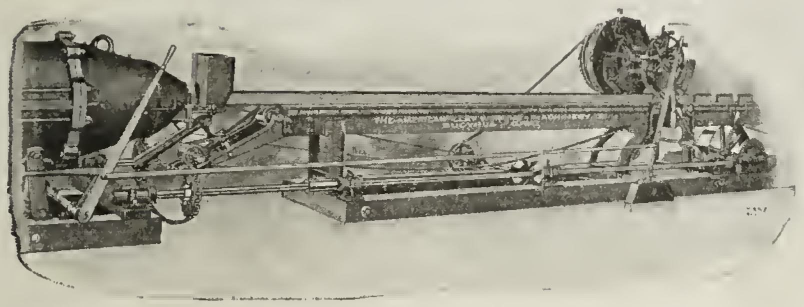
ROOFING TILE PRESS.

We build four styles of Roofing Tile Presses for the pressing of Hip Rolls, Crestings, etc. Write for complete description.



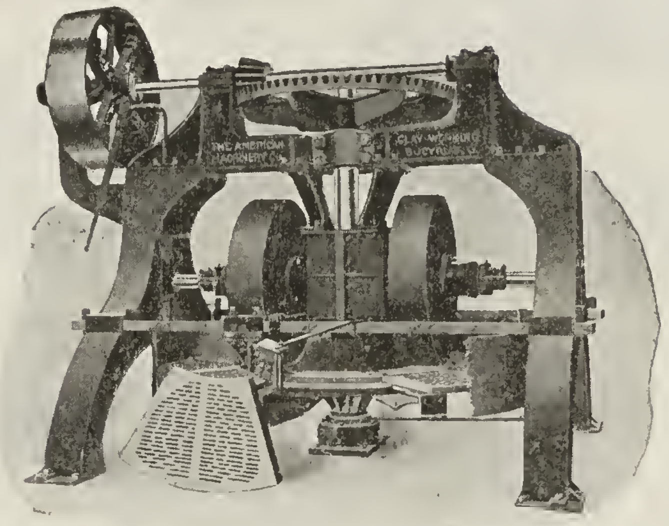
SEWER PIPE MACHINERY.

We build three styles of Sewer Pipe Presses, together with all appliances for a complete plant. Send for our big catalogue.



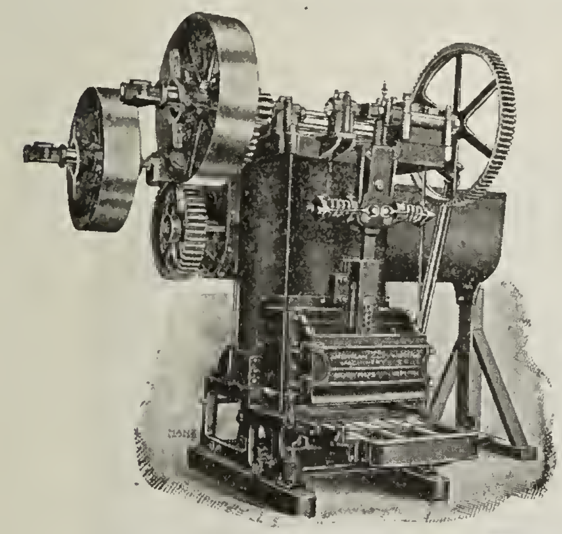
AUTOMATIC, END CUT, BRICK CUTTER, STYLE "P."

For end cut brick this machine is excellent. We build several styles of automatic cutting tables. Write for particulars.



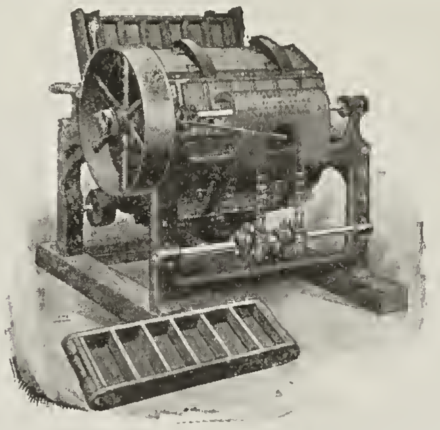
DRY AND WET PANS.

We build twenty styles of Dry and Wet Pans in varying capacity. They are all constructed of iron and steel and are most substantial. A complete description of the full line will be sent for the asking.



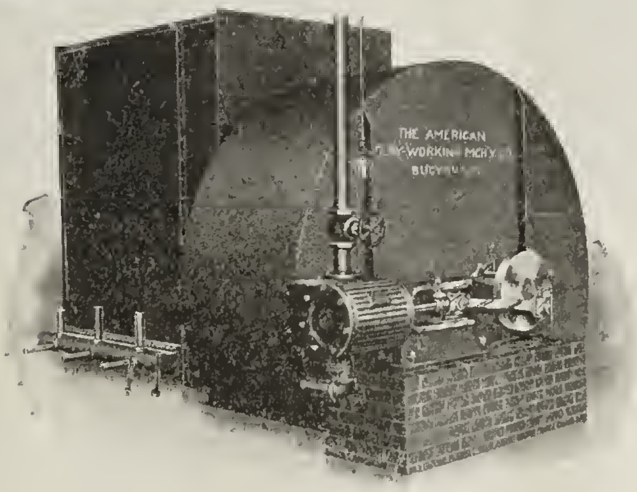
SAND MOLD BRICK MACHINE.

This machine is especially adapted for sand mold brick. It is an excellent machine. Write for a complete description.



CHAMPION MOLD SANDER.

This is an excellent machine and sand molds evenly and economically. It is entirely automatic. Send for description.



WASTE HEAT AND STEAM DRYERS.

We build both waste heat and steam dryers and can dry the most tender clay. Plans and estimates furnished upon application. We can dry your product at one-half the present cost or less. The cut is of our waste heat dryer outfit.

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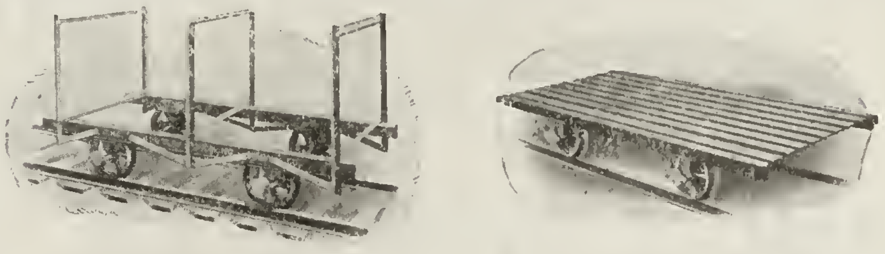

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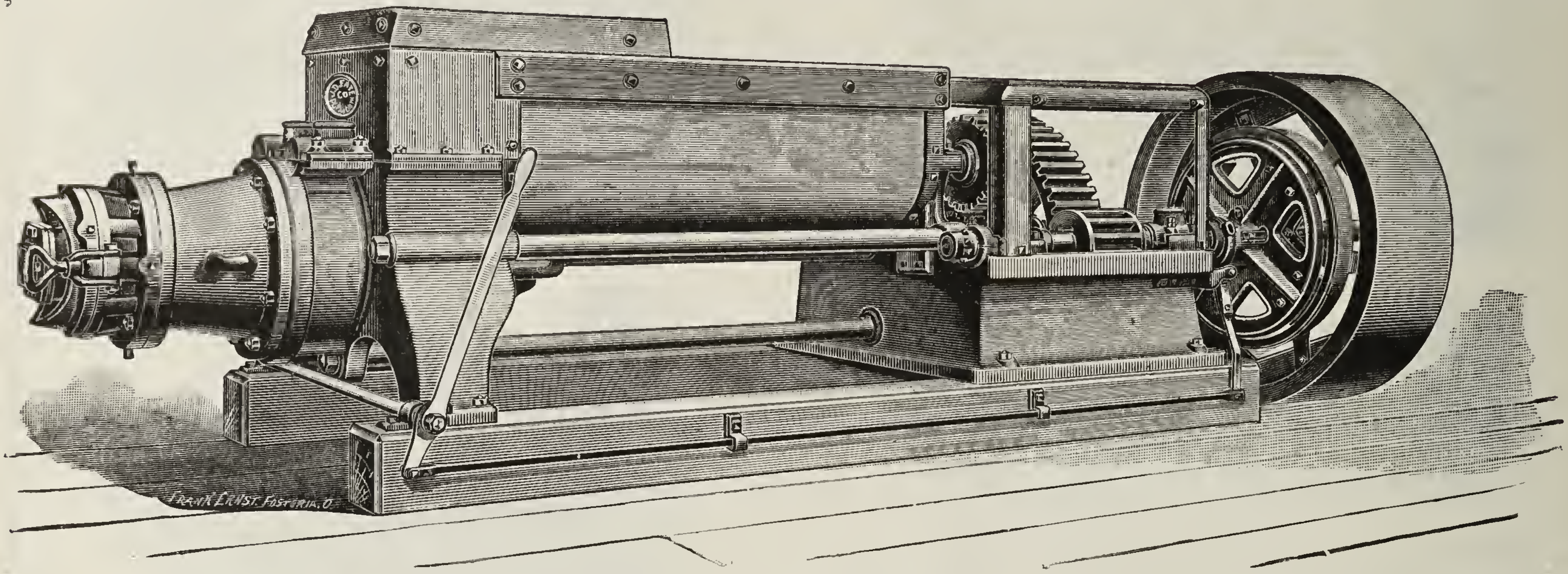
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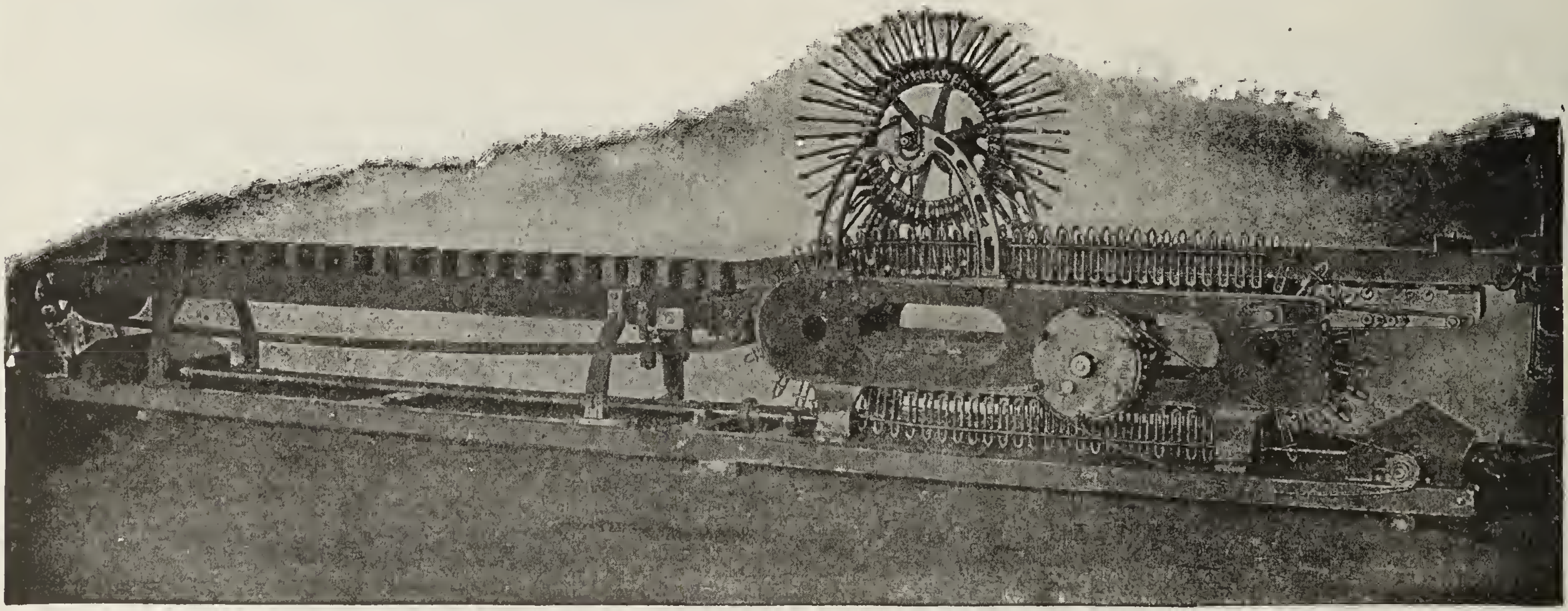

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CLAY RECORD

Vol. XXVI. No. 6. CHICAGO, MARCH 30, 1905. Semi-Monthly, $1.00 per Year
Single Copies, - 10 Cents

OPEN AIR VS. TUNNEL DRYING OF BRICK.*

By F. Vogt, Milwaukee, Wis.

It is needless to say that a thorough, uniform drying of the brick before going to the kiln, is absolutely necessary to obtain a good, uniform burn, because every brickmaker knows it.

If brick, only partly dry, are set in kiln, the only way to obtain a fair burn, is to dry them in the kiln; the most expensive way of drying.

The old way of drying soft-mud bricks was accomplished by dumping the brick from the molds on the yard, there either to become dry or to be reduced to mud again as Providence would have it. Every heavy rain storm would ruin one or two days' work in part or entirely and the spoiled brick had to be carted back to the pit and made over again, possibly to share the same fate the second time.

This expensive and antiquated way of drying having generally been discarded, no more need be said about it.

Next the pallet system came in use. The brick were dumped on foot pallets and then trucked to the yard and the pallets set about 10 ft. high and then left standing until dry enough to be taken to kiln.

Another method and more generally in use at present is the drying in racks, permanent structures with a board roof over each row of racks. With this method board pallets are used, the pallets placed in the rack shelves and the brick when dry enough to handle are edged and when dry carted to kiln and the pallets returned to the brick machine.

Either of these pallet systems is a decided improvement over the old way of dumping the brick on the yard, not only rendering the brick comparatively safe from the elements after once made, but a more perfect shaped and smoother brick being produced. However, the wear and tear of the pallets and necessity of handling them so often makes the brick rather expensive, compared with a stiff-mud brick.

The stiff-mud process, admitting the handling of the brick as the machine delivers them on the belt, thus saving the bothersome and expensive handling of pallets, are wheeled to the drying shed and piled first 5 high and when sufficiently dry to stand more pressure 10 high and when dry wheeled to kiln.

This method, while cheaper and simpler than the handling of pallet mud bricks, still makes a double handling of the green brick necessary; from machine to drying shed and from there to kiln.

The latest and probably most improved and cheapest method of handling stiff-mud brick for open air drying from machine to drying shed and from there to kiln, is the use of cars with a lowering and rising deck.

To operate this system the yard has rail tracks the same as a tunnel drier. Over each track is either a board or canvas roof. The uprights of roof supports on each side of the track have 2 x 4 in. stringers running parallel with the rails at the proper height from the top of rails.

The cars used are identical with an ordinary tunnel car, except that they have a lowering and rising deck, manipulated by a lever admitting of the lowering and raising of the load on the car at pleasure.

The cars have plank pallets and from five to six hundred brick are piled on each car at the machine and then forwarded to the drying shed track. Before the car is loaded, the deck with the pallets is raised by operating the lever and the pallets, projecting on each side over the car, rest with their whole load of brick on the stringers as soon as the deck is lowered, after the car reaches its destination. The car thus relieved of its load is returned at once to machine to be loaded again.

The handling from drying shed to kiln is done in the same manner. Only a few cars are needed for handling the green brick from machine to drying shed and the dry brick from drying shed to kiln by this process.

It will be readily seen that by this method the brick can be handled just as cheap as in tunnel drying, requiring but one handling. The only extra expense is the returning of the pallets from kiln to machine, which is more than offset by the drawbacks and disadvantages experienced in handling loaded cars in tunnel driers. Another decided advantage is that but one loaded car is moved at the time, thus securing the delivery of the brick to drying shed and kiln in as perfect a state as the machine produces them.

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*Read at the Manitowoc meeting of the Wisconsin Clayworkers' Association.

Having demonstrated that by the last described system of open air drying the handling of the green brick is just as cheap as in tunnel drying, the question naturally arises:

What are the advantages of tunnel driers and under what condition shall the brickmaker adopt the one system in preference to the other.

Where conditions are such that the brick-making can be carried on to advantage nearly the entire year, tunnel driers are undoubtedly to be preferred. The operation of a yard the entire year enables a larger output with a certain equipment. One set of machinery may be sufficient to produce the desired production for the year, where two sets of machinery equivalent to nearly double the investment would be required to produce the same amount on a summer yard.

By giving employment to the men nearly all the year round, a better and more reliable class of men can be depended upon, than on a summer yard, where they have to look elsewhere for a winter job, many of them not to come back in the spring, necessitating the employment and breaking in of green hands.

These are, in my opinion, the main, if not the only, advantages of tunnel driers over a modern open-air drying system.

In our severe Wisconsin climate, where brickmaking during the winter months has many drawbacks and is always connected with extra expense, I venture to say a modern open-air drying system is the best and the cheapest.

The first cost of an open-air drying system may be just as high as the building of a tunnel drying system with all the necessary auxiliary devices for operating same, such as fans, blowers, exhaust pumps, boilers, etc. But once built right, an open-air drying system will not be subject to any expensive repairs or overhauling for a number of years, which cannot be said of tunnel driers.

Furnaces ever so well built soon need overhauling. The iron decks on tunnel cars soon rust away by the action of acids and moisture and must be renewed at great expense. Leaks occur in steam pipes and connections, fans and exhaust pumps give out at the most inopportune time. But one of the greatest disadvantages in tunnel driers is the handling of loaded cars.

As you all know, a tunnel drier contains on each track from 11 to 14 loaded cars, according to the length of tunnel and cars use. Every time when a new car with green brick enters the cold end of drier a car with dry brick is taken out at the hot end.

The drierman has to push a string of from 10 to 13 loaded cars every time a car enters the drier.

With the most competent man at the pugmill it cannot be avoided that at times clay is molded softer than desired; sometimes even due to the clay being too wet in the bank, in which case it is beyond the control of the man at the pugmill.

The least obstruction in the tunnel, a few brick tumbling from the car, makes it impossible for the drierman to move this string of cars without extra help and assistance of pinchbars and the consequent jar often causes a whole car of brick, especially when molded a little softer than usual, to sag down, obstructing the circulation in the tunnel and thereby preventing proper drying—and such brick when partly dry are apt to tumble down and the whole string of cars to the one causing the trouble have to be pulled out of the tunnel, the debris removed and the cars replaced.

Leaks in steam driers are frequent occurrences and crawling between the steam coils to mend such leaks is one of the most hated jobs of a brick yard engineer or helper, and when occurring nights often means setting wet brick in kiln in the morning or stopping the machines until the brick are dry.

To sum it all up, on one hand there is a modern open-air drying system, by which the brick from machine to kiln can be handled just as cheap if not cheaper than in tunnel drying. The brick go to kiln in as good shape as the machine produces them, only one car having to be handled at the time, which can be done by one man with ease at all times. There can be no obstruction in the way of the car that the man could not see and easily remove—no expensive fuel bill every month, no expense when shutting down in the fall—no expense overhauling in the spring, no night men to watch and control, and last, but not least, fewer checked and broken brick than in tunnel driers.

On the other hand, the tunnel drier admits of a longer season and a larger production of brick with the same equipment, but there is constant source of expense—a big fuel bill every month, the necessity of the employment of competent men day and night, expense when you shut down in the fall, expensive overhauling before starting, the inability to work in the tunnels while in operation without delaying the drying, the jarring of the green brick by the moving of the cars in the tunnels and a larger percentage of checked and broken brick than by open-air drying.

In conclusion I will say a few words in regard to the rapidly changing condition of the Wisconsin brick industry, which may be swerving off the subject, but not entirely foreign to it. Up to about ten years ago, when soft-mud brick, with very few exceptions, were the only kind of brick made in Wisconsin, people were satisfied to use local brick for new buildings, selecting the best for fronts and veneering.

This condition has entirely changed of late and in some places where even eight years ago 90 per cent of the facing of new buildings was done with local brick, the reverse is the case to-day,—90 per cent of the facing being done with imported pressed brick.

A cheap common brick regardless of looks for warehouses, factories, etc., and a pressed brick for fronts and veneering of stores and residences will be the two distinct bricks of the future.

A stiff-mud brick with a modern drying system will supply the cheap common brick and the dry press brick yards, the front brick.

The soft-mud bricks will have to go, as they can not be made cheap enough to compete against stiff-mud brick, the latter having the further advantage that they are tougher and can stand rough handling better than soft-mud brick.

Make a cheap, well-burned stiff-mud brick. It will be the only way to stop the encroachment of neighboring competitors in our territory and compete successfully against substitutes for clay brick such as sand-lime brick, hollow concrete blocks and cement-sand brick.

A GOOD ARGUMENT FOR THE TILE MANUFACTURER TO THE FARMER WHO HAS STIFF CLAY LAND TO TILE.

Lands that are too wet to grow crops are beneficial by tiling, because they allow the air to displace the water. This displacement must take place by having the lower layers of water in the soil drawn off. The physical character of the soil influences the rate at which the lower layers of water are taken off through the tiles. In general, after a tile is put in place the water within the soil that comes in contact with the tile will lose its surplus water by seepage into the tile. If, however, the soil particles are so uniform in size and so small that they fit closely together, seepage is slow. To illustrate this, says Geo. M. Tucker, from Missouri, compare the clay that a potter prepares for his pottery with good clay loam of a field. The potter's clay becomes impervious to water and is of no account whatever for crops. Compare, indeed, a stiff clay subsoil with a piece of the tile itself. By making a little hollow in the former it will hold water, while the tile has a clear ring when tapped with a piece of metal and will not hold water.

The ability of the clay to hold water is due to the clinging force of the water in it that holds the very fine particles of the soil against each other and against the larger ones. Twenty-five thousand of these small particles may be placed in one inch of space. The water thus acts as a cement to hold the soil particles in place and prevent them from moving. This takes place only when the water is not in motion, or when the motion is so slight that the particles are not disturbed. Or again, the one which is operative in drainage, when there is movement of the water and consequent movement of the soil particles, but with an abundant store of particles in the adjoining layers of soil to replace those moved by the water so that the displacement of the particles has no effect on relieving the compactness of the soil.

Clay consists of very small particles of soil; yet a large quantity of these particles are much smaller than others. As soon as a tile is placed in the soil the movement of the water next the tile carries with it toward the tile, because there it finds an outlet, a very few of the very smallest soil particles. But owing to the very compactness of this clay soil the movement and consequent displacement of soil particles is very low. As one particle moves with the water toward the drain, another particle further away from the drain tile moves to take its place. This succession of movement of one particle after another slowly takes place until the process reaches the surface of the field, and as the last particle moves one place down toward the tile there is no more to follow it, so, as it passes on toward and finally reaches the tile some three feet below the surface of the field, there is an opening behind it equal in size to the particles that reach from the tile to the surface of the field. A little canal is left which in wet weather conducts water to the tile, and in dry weather serves to ventilate the soil, allowing air to pass either upward or downward, or acts as a capillary tube for letting the water from below the tile crawl toward the surface of the field in time of dry weather.

Do not understand me to mean that there is made a continuous unbroken canal from the tile to the surface of the field by the action of this process, for bear in mind that there are something like 25,000 particles to the lineal inch, making something like 625,000,000 particles in one cubic inch of soil, and that they are all moving slightly around between the larger ones at the same time, so that as one reaches the tile from the surface of the field many thousands have reached it and there are many thousands yet to follow. So in a tile drained field, where the tiles are effective, we have a complete net-work of little tubes or canals, very much crooked and twisting in their course, but each capable of conducting a fine stream of water from the surface of the field toward the drain, and in the aggregate a considerable body of water will sink into the ground in an incredibly short time.

This, in the main, is the working of a tile drain. The rate at which this process goes on is what interests us, and this depends upon the size of the soil particles. A very fine joint clay will be affected by a tile drain, and in time operate with surprisingly good results on the productivity of that soil. It may take a number of years before the minute soil particle from the surface of the field will find its way to the tile, but it will, and then compensations will be entirely satisfactory. The writer has known of fields in which tile drains were placed and no perceptible results could be discovered for six years, but today those tile respond to the slightest rainfall, and crop production has greatly increased.

It is a natural process of displacement—tile drainage is—and no soil is too fine to respond to it in time. Tiling relieves the pressure from below and natural laws do the rest. The length of time depends on the fineness of the soil.

The tile should be placed deep in a fine clay soil, bnt close together, and the mouth of the tile kept free from obstructions. In this way the writer has seen soils that were considered too stiff for tiling changed in texture, and water flowing freely from the mouth of tile that for the first few years remained dry. The successful farmer must exercise the patience and perseverance of nature herself and give natural laws opportunity and time to act.

OHIO FINANCIERS CONSIDER SPENDING $75,000 ON THE VENTURE.

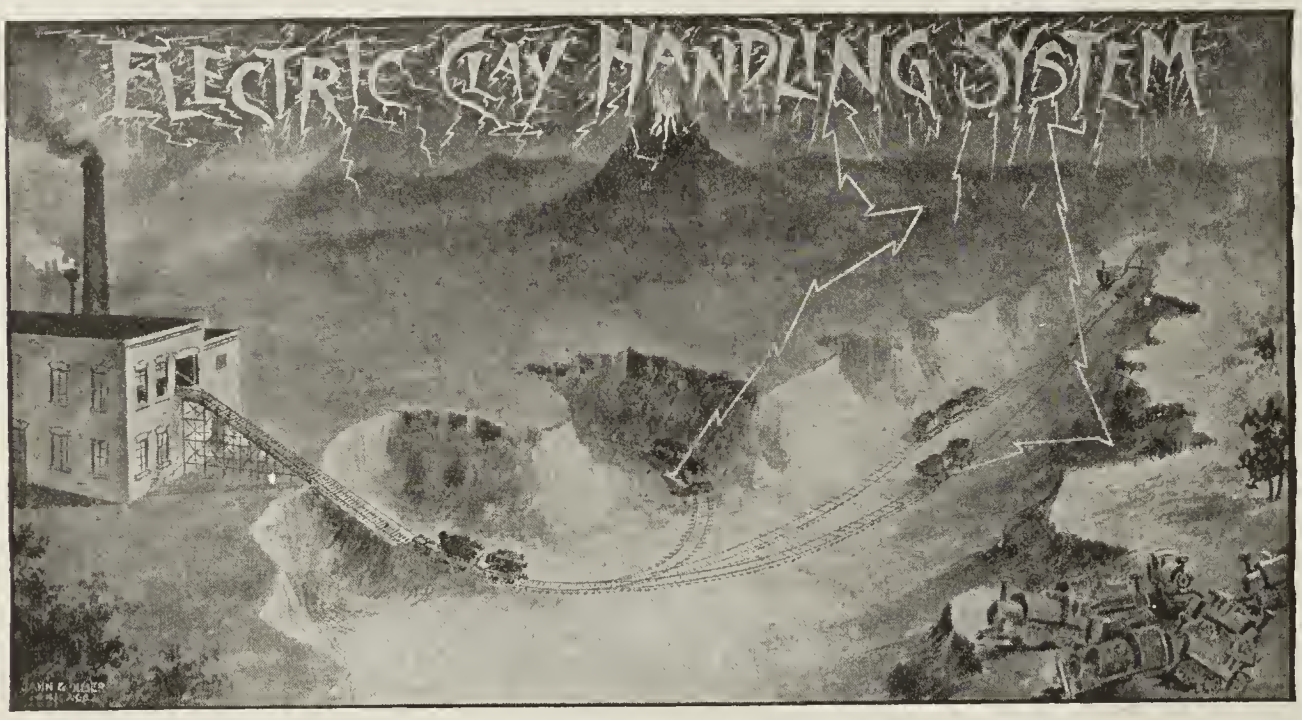
Capitalists of Cincinnati and Hamilton, O., are in conference with Louisville, Ky., business men regarding the location in this city of a plant for the manufacture of fire brick and all fire-clay products, the erection of which will cost more than $75,000.

About 500 acres in Madison and Rockcastle counties, which are said to be rich in deposits of fire clay, have been purchased by the Ohio and the Louisville men. Prof. J. F. Elson was largely responsible for interesting the capitalists in the project.

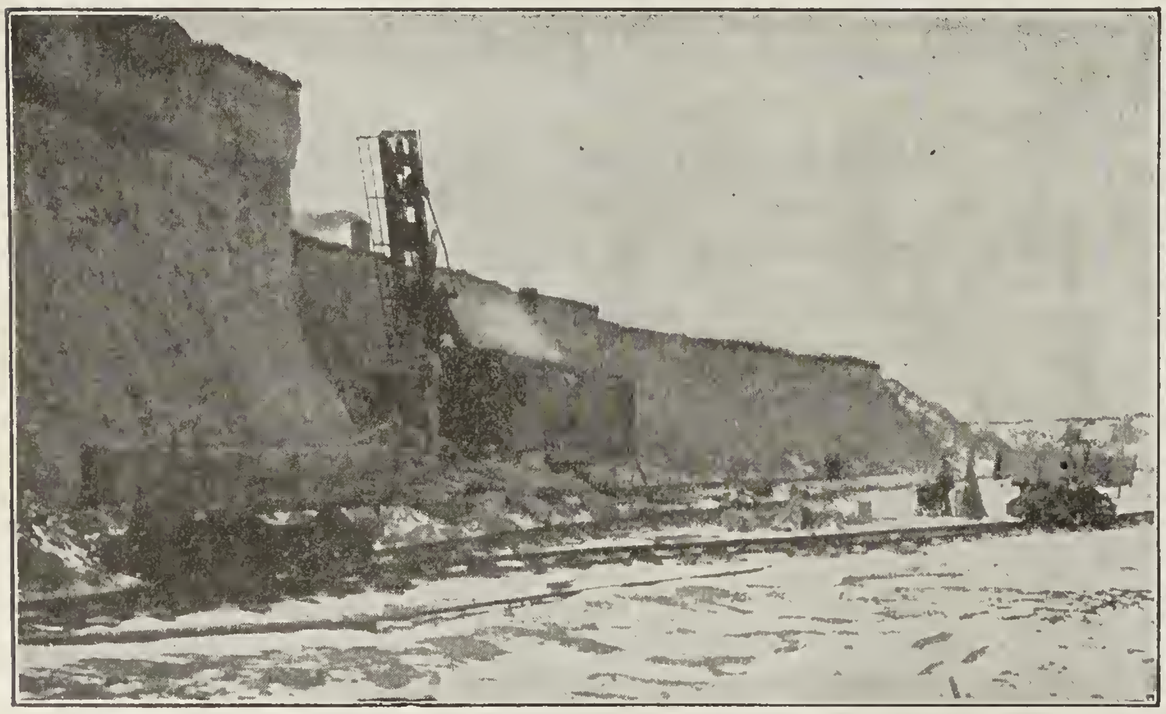
The site for the plant in Louisville has not yet been decided upon, but will be within the next few days. From ten to eleven acres are desired. An effort is being made to secure the location of the plant in Cincinnati, but the railroad facilities in regard to the shipping of the clay from Madison and Rockcastle counties are considerably more direct to and from Louisville than to and from Cincinnati, and this, it is thought, will influence the decision in favor of that city.

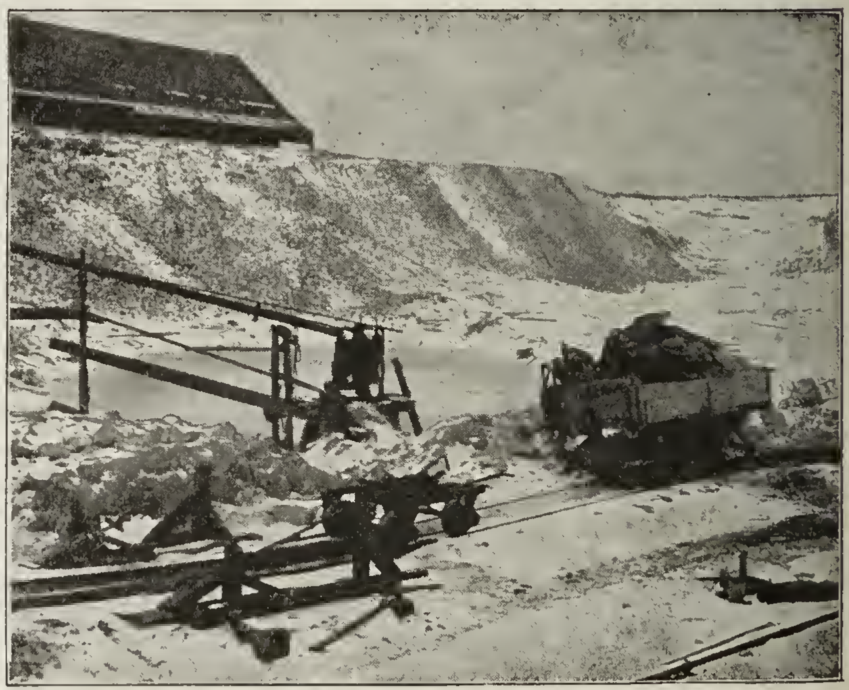
A MEANS OF HAULING CLAY BY ELECTRICITY.

The Electric Clay Handling System which has proven such a marked success as a means of transporting clay from the bank to the machine, is one of the new features in clay working improvements. As a labor saving device it appears to have no equal, the clay being brought up to the machine by apparatus, operated and controlled by the man who dumps the cars. As some one has described it,—"clay simply comes, we do not have to bring it."



Ordinary dump cars are equipped with motors of proper size and made to operate over the ordinary clay pit track, by adding a third rail for the conduction of the electric power. This rail has such a low voltage in all cases that any one may step on it or handle it without injury. It is a simple matter to lay this rail, which is the only alteration the track needs, and it stiffens the track to a marked degree, through bad places as are found in all clay pits. To shift the track or extend it is just as easy as a track of two rails, and takes no longer; and as one superintendent remarked,—"We moved our track much more quickly this time, as we had no crossings for horses to build."


Car Approaching the Shovel from Return Track.


Foot of Incline, showing Automatic Coupler.

The cars are equipped with an electric brake as well as the motor, which is also under control by the man at the dumping station, thus making grades in the pit of no consequence to the system. This man has control over all the cars as they go to the shovel and return to the plant, and is able to stop them at any point between. He has control over each car separately and may run it either direction at will. The cut (2) shows cars approaching the shovel at the clay bank of one of these installations. As soon as it is loaded it makes its trip to the foot of the incline in this case where it is met by an automatic coupler, which attaches itself to the car, and together with the car is hauled up the incline by the cable hoist, and there dumped. Cut 3 shows the automatic coupler ready for a loaded car at the foot of the incline, while cut 4 shows the man operating the cars and the cable hoist. This man is at the dumping point or granulators. Wherever a very steep incline is in use, this system works in connection with the cable hoist as in this case.

The labor in all cases is reduced to a minimum, as the man who formerly operated the hoist, operates all the cars after this system is installed. When the shovel is not in sight for this man, the operator of the shovel controls the cars at the bank, "spotting" them for loading and sending them back to the foot of the incline.

The patents on the system are owned by Hauser Company of Chicago, who are installing it throughout the country. They have made many improvements in it since the first installation, and are using only the best of machinery and appliances throughout in its construction. There are no water pipes in it to freeze in the winter time and no coal or wood to truck to the pit for its use. It needs no coaxing to induce it to "haul clay" and is always ready when needed. Electricity for it is generated by a very small dynamo belted from some convenient shaft of the plant, and clay for a 300 M daily capacity plant may be transported over a thousand feet with an expenditure of less than three average horse power.

Hauser Company was represented at the Birmingham convention by Mr. Obenland, vice-president of the company, and Mr. Woodford, chief engineer. They exhibited a working model of the system which attracted large crowds whenever the little cars were caused to make the trip to the loading point, back, up the incline and down again as the cars in actual service. The convention delegates were interested, not alone in the model, but vitally interested in the possibilities it presented for their individual plants.

Operator of Electric Clay Handling System.

THE WISDOM OF MAKING HASTE SLOWLY.*

J. E. Budwig, Birmingham, Ala.

I have a few words to say at this meeting in reference to the old proverb, that of the wisdom of making haste slowly. This subject, we all know, has been thrashed and rethrashed so many times that nothing but chaff remains, but I will endeavor to secure a few grains of sound wheat from this subject. How well I succeed, it is for you to judge, and all I ask is to do this leniently. The art of making haste slowly is, in this present age of ours, as you have no doubt found, one of our most difficult tasks, as with the constant rush of affairs, it allows no drone in the hive and consequently forces us to be up and doing, making us the more anxious to devise ways and means, whereby our business may be better fitted to meet the requirements of the demand for more and better material. This cannot be condemned, for this very ambition caused by constant demand upon our resources is the spice of our business career, and in no business is this more necessary than in the manufacture of clay products, where every day brings forth something new for us in the way of experiment and study. We are not alone in this, as the manufacturers of clay-working machinery are constantly on the alert for better and more modern devices by which our product can be improved; so with all this going on around us, is it much wonder that the matter of making haste slowly is more than a difficult task? Still, friends, this in my estimation, is one to be regarded by us all very carefully, should we hope to be successful, for, from my experience, there is nothing that has more difficulties so hard to overcome than the manufacture of clay products. Every day brings forth some new problem to be solved either in the crude material, grinding, drying and burning, which, after having been solved, we find how easily it would have been to have avoided these difficult problems had we made haste more slowly by being careful of detail, such as testing our crude material by every known method, not only one or two tests, and then of only a few pounds, but having it analyzed thoroughly from time to time, thereby being thoroughly acquainted with our clays at all times, as we all know that it varies as we work our pits or mines and that the same results cannot be had on account of this variation, and so by constantly watching our analysis, we find that the trouble can oftimes be obviated by the mixing of clays of different analyses, making our product more uniform in quality and reaping a far better harvest for ourselves. Another essential point of making haste slowly is in the erection or remodeling of plants. I have known instances where this has been done without any definite plans as to the requirements in regard to capacity, ofttimes not knowing what the actual output should be, so as to have ready sales for the ware. If we build too small, we increase the cost of production on account of fixed charges, which are usually our largest item of expense, and, on the other hand, if we build an immense plant, and the demand for material is not great, it means the having of a large working capital, the accumulation of stock, which must eventually be thrown upon the market at disastrous prices, thereby not only injuring ourselves, but causing our competitors equally as big a loss and worriment to dispose of their product. These, I think, can be avoided by the careful study of business conditions in which plant is located, as supply and demand will always regulate prices, so think a good suggestion along this line would be to find out the amount of brick usually used, prices paid and the amount manufactured, then erect or remodel a plant to meet the demand at that time, arranging it so as to be able to increase the capacity as the demand requires. By this it is not meant that the first time there may be a larger demand than usual to rush in with all haste, increase capacity to such an extent that more often than not there is a large increase of indebtedness or the decrease of working capital to the detriment of possibly an already fine dividend-paying plant. Therefore, in conclusion will say that by looking into details in every department—crude material, construction, manufacture and marketing—make haste slowly, meeting the demand with the best material that can be manufactured, putting in a new equipment as required of the best that can be purchased, being exceedingly careful that it is what you want when installed and ready for operation, surrounding yourself with competent employes and not flooding the market with over-production to the detriment of yourselves and others. I think that by pursuing this course, all would be benefited and our business be made a pleasant as well as a profitable one.

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*Read at the Birmingham meeting of the N. B. M. A.

SAND-LIME BRICK TESTED AT MECHANICS INSTITUTE.

At the Mechanics Institute the new sand-lime brick manufactured by the Rochester Composite Brick Company, received an extraordinarily severe test. The test was conducted by Allan S. Crocker, head of the mechanical and steam engineering departments of the institute.

While waiting for the brick to become thoroughly heated, Mr. Crocker placed a brick in the huge Rehle machine used in testing the crushing strength. A pressure of 70,900 pounds was applied before the brick showed any sign of crumbling. This pressure is equivalent to about 5,100 pounds to the square inch. Compared with the strength of other brick this is indeed remarkable, as common clay brick can stand only 400 to 600 pounds and machine pressed brick about 4,000 pounds before disintegration begins.

The fire test was conducted in the machine shop, where two sand-lime bricks and one common clay brick had been placed in a gas furnace under a strong heat blast. The bricks were left in the furnace for nearly an hour, during the latter half of this time being subjected to a heat of 1,500 degrees. They were heated to a cherry red clear through. As the heat of a common wood fire is variously estimated at from 800 to 1,140 degrees Fahrenheit it is easily seen that this heat subjected the bricks to a much harder test than would ever occur under ordinary circumstances. It speaks well for the fire resisting power of the sand-lime brick that of seven brick tested (five of the same lime variety and two ordinary clay brick) all the sand-lime brick were intact, retaining their bond and compression perfectly and showing no bad effects as the result of the tremendous heat. One of the clay brick stood the test exceptionally well while the other crumbled to pieces when touched by water. After being taken from the furnace all the brick were placed under a stream of cold water; here the superiority of the sand lime brick was again demonstrated, for instead of crumbling as ordinary clay brick generally do, the sand-lime cubes remained perfectly intact, seemingly impervious to the extremes to which they had been subjected. The only sign of the heat shown by the sand-lime bricks was the fine hair line cracks appearing after the application of water; otherwise the brick seemed unaffected.

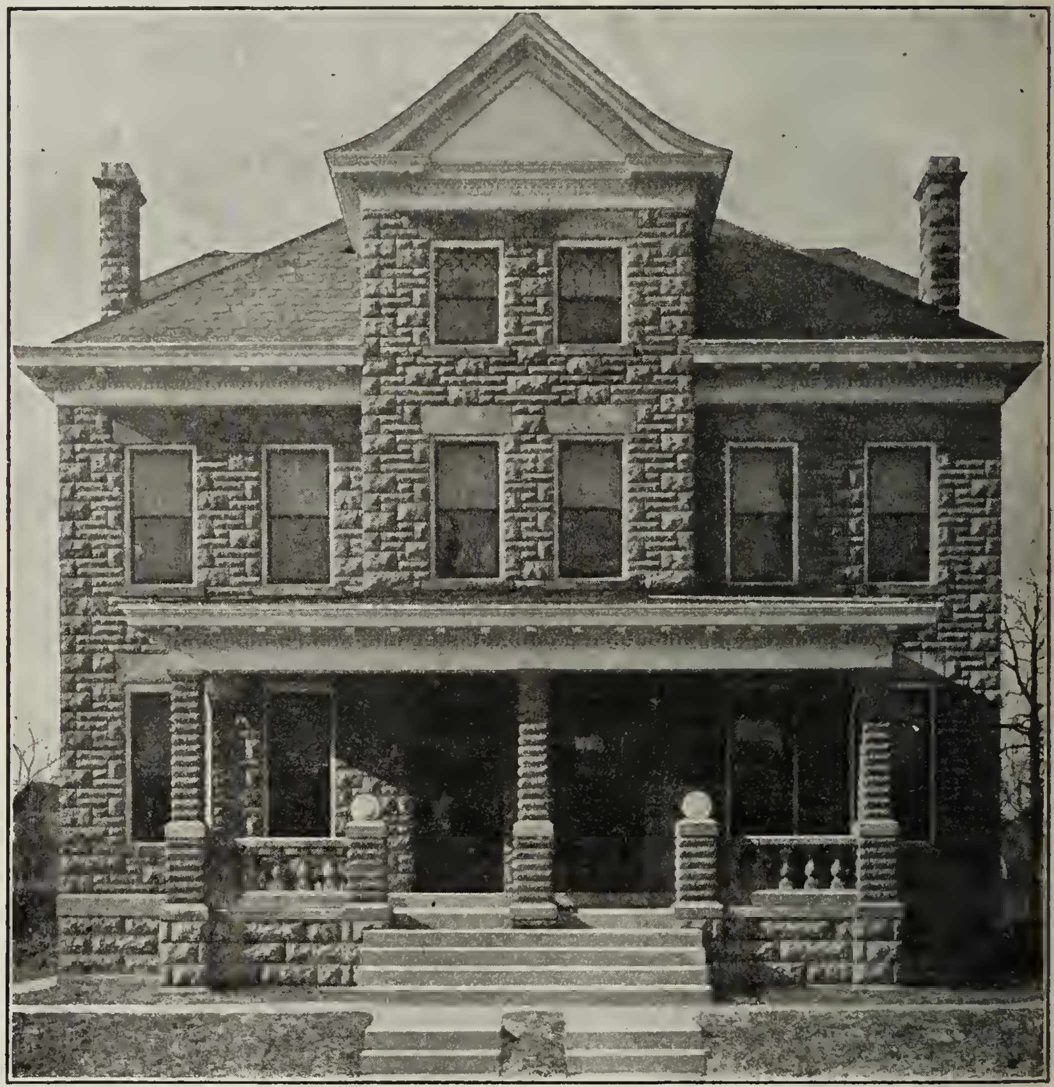
In addition to being fireproof the new brick is impervious to frost and water. At the test in the afternoon several specimens were shown which had undergone a frost and water test equivalent to fifteen years' wear, without showing the slightest deterioration; on the contrary the bricks were harder than before the test. The nature of the ingredients of this brick is such that exposure to air and water tends to make the brick more and more like adamant.

In the matter of labor-saving the sand-lime brick is in the first rank; although heavier than the ordinary clay brick, it is much easier to handle and being made in half and quarter sizes, it does away with a great deal of time in patching.

The new brick is a handsome gray, although, by the introduction of mineral colors any desired color may be obtained. The Rochester Composite Brick Company contemplates erecting a plant in this vicinity. Although rather reticent on this matter, the secretary, Lawrence E. Elkus, admitted that a plant having a daily capacity of 30,000 would probably be erected in Irondequoit on the line of the Sea Breeze road provided a suitable site could be obtained. At present the company is located in the Exchange Place building.

A CEMENT BLOCK FACTORY AND ITS PRODUCT.

"The Earth is the Lord's and the fulness thereof," and out of, and from the earth, has come the wealth of nations. "Time out of mind" all peoples, uncivilized and civilized alike, have found in the bosom of Dame Nature the elements contributing to their health, happiness and prosperity, but appropriating them in a relative degree only. It has been left to the civilized nations of the twentieth century to utilize these elements in a degree and to an extent not hitherto reached. And nothing yields more satisfaction than to report from time to time what elements are utilized, or to describe the processes as well as the machinery most available and best adapted to secure the ends sought.



Front View of Columbus (Ohio) Residence, cost $8,000, built of Normandin Concrete Blocks.

Notwithstanding the fact that tradition and history, both human and divine, acquaint us with the elements of the earth and the uses to which they have been put, the fact that it is alleged that the first man was made out of the dust of the earth, although we may be stumped, as was the black man, on this question, who, upon being asked how man was made, proceeded to say "that the Lord took the wet clay and formed it into the shape of a man and stood him up against a fence to dry," whereupon his questioner, whose doubts got the better of him, demanded of his instructor "who made dat fence"? Yet how ignorant are we all of what the clays of the earth have yielded to mankind. If you were to question ten men what the earth has yielded or what particular element has contributed most to the comfort and welfare of the nations, it would occasion no surprise if every reply should be, Why, gold, of course, or perhaps iron or coal! But never a reference to the clays or shales, and yet it is susceptible of proof that the latter leads either in what it has contributed to the comfort, the convenience and, not the least, the prosperity of the dwellers upon the earth.

But to the real subject of this article. Cement (used in its general meaning), in building, and a machine eminently successful in forming the material for this purpose.

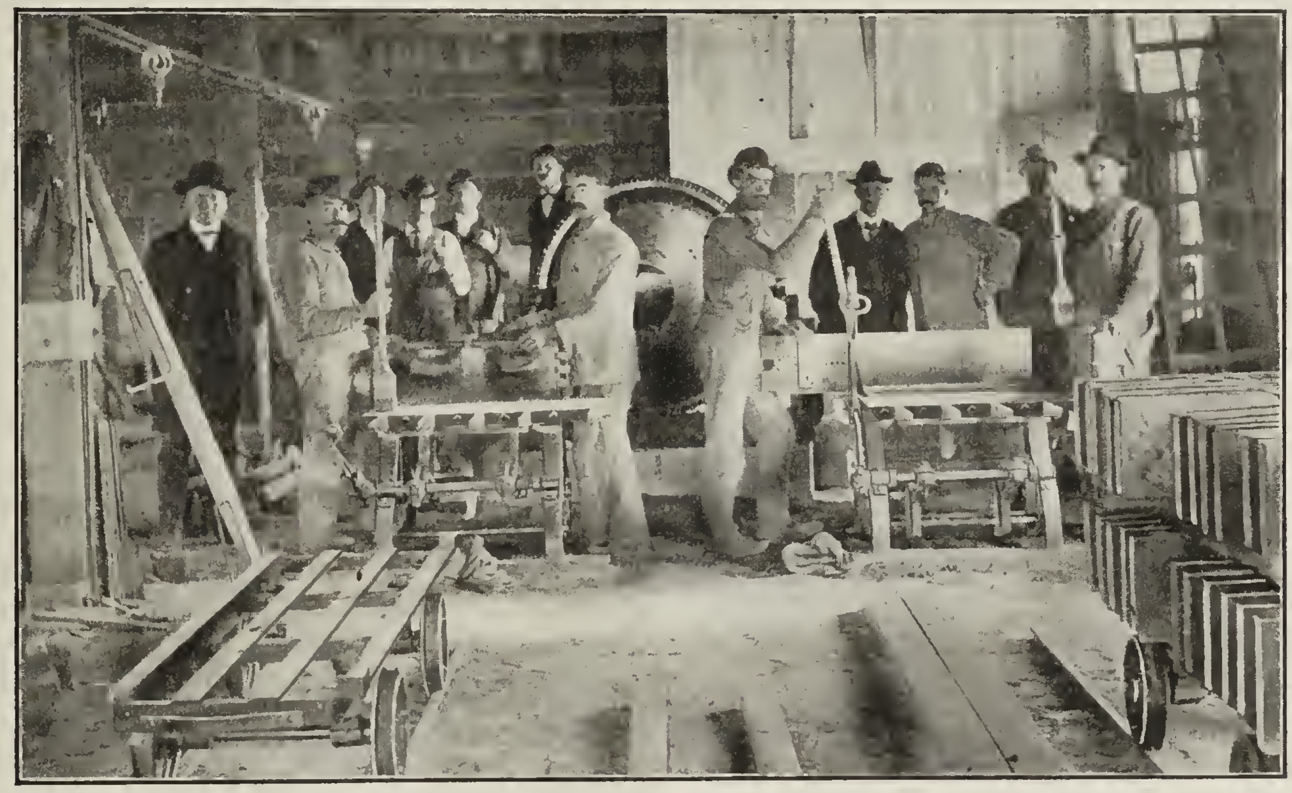
You will be surprised and interested if you will investigate recent construction work in this country and Europe, noting the prominence of Portland cement in buildings of every description. History is interesting, unfolding as it does the march of events, though vaguely, at times, and philosophers, in generalizing the events in the past, have spoken of the Stone Age, the Bronze Age, the Iron Age, and may we not, and with reason, speak of this age as the "Age of Cement"?

There is probably no product in the world of which wider application to useful purposes may not be made than is possible to Portland cement. Take the Portland cement concrete used in sidewalks, street beds, or roadways, now so extensively recommending itself because of its smoothness, firmness and durability. Is it surprising, then, that men should be inquiring whether in some form of blocks this material, because of its strength, form, beauty and durability, may not be used as building material? and whether such material may not become the ideal building material? These questions suggest some information which we have culled, and which, with pleasure, we give to the reader, hoping to furnish in a degree satisfactory replies to these questions.

The block form most readily, if not the most naturally, suggests itself as the form best adapted for building purposes, suggested by timber, brick and stone construction, and this block form has been adopted and the study of it is suggestive and interesting. Its appearance in a building is clearly shown in cut on opposite page. This building is constructed of material known to the trade as the Normandin-Concrete Construction blocks, and its builder enumerated some of the advantages gained in using this material. First, a saving in cost of construction. Again, that his building is handsomer in appearance than any other material could have made it. Further, that it has proven to be warm in winter and cool in summer, attributing it to the hollow air chambers. This is strange, but as experience and tests have proven it, it must be true, and the hollow chambers have done it.

The manufacturers claim that buildings built of these blocks are fire, frost and vermin proof; that it is impossible to burn up a Normandin block wall; that with age and exposure these blocks become more substantial, besides many other features collaterally valuable.

This construction admits of the most elaborate designs, obviating the use of galvanized iron work, and the Normandin blocks can be used for both straight and corner blocks. The ready susceptibility of the mixture will receive most any color or tint; this being the case, should render it attractive enough to please the most aesthetic taste. All the varied hues of stone or marble may be produced, while its lasting qualities are alleged to be equal to those of granite itself.



Interior View of Lancaster (Ohio) Concrete Block & Paving Co.'s Plant, equipped with Normandin Machines.

The reader doubtless before this has raised the question: Well, who makes these blocks? or, who builds the machinery required to manufacture these blocks? The Cement Machinery Co., of Jackson, Mich., whose machines in operation run into the hundreds, manufacturing thousands of blocks daily, in the United States, Canada and England. Observe the cut showing the interior of the Lancaster Concrete Block plant, Lancaster, Ohio, operating two machines. Besides indicating the mixture, block cars and equipment.

This article could not, owing to the limited space, go further into the details of this most interesting industry; therefore, write the Cement Machinery Co., Jackson, Mich., mentioning having read this article in the Clay Record, and further information will be cheerfully given you.

THE GOOD ROADS MOVEMENT AND THE PART PAVING BRICK SHOULD HAVE IN IT.*

R. W. RICHARDSON, OMAHA, NEB.

You are to be congratulated, Mr. President, Ladies and Members of the National Brick Manufacturers' Association, upon giving recognition to the subject of highway improvement by assigning it an especial part in your proceedings, and I am grateful for the honor of presenting it.

THE COMMON ROAD.

I know of no subject so closely and intimately related to all our domestic and public affairs as the Common Road. Over it is transported the product of the field, the forest and the mine. It brings to us our daily needs and carries to the consumer the output of the factory and store. It is at the base of our commercial and material prosperity. It leads to the school, the church and the home. It is the common property of all. The business man and the farmer, professional man and the laborer, the artist and the artisan, saint and sinner, man, woman and child, maid and matron, young and old, rich and poor, healthy and sick, the lame, the halt and the blind, all get a share of benefit from a good road. It is a mark of progress in the community, a generator and radiator of blessings to all who live upon it, or who move upon it. It adds value to lands and property, regulates trade for the merchant, steady run for the factory and is an equalizer of traffic on railways and water-ways.

It is the most domestic of all public institutions. It guarantees more for the freedom and independence of the people than any other public improvement.

Our public roads should have our first consideration, they have our last. They should have the best attention, they get the worst. They should be the concern of all, they are left to the indifferent care of the few.

Our country can boast of its progress in everything save in its public roads. Ninety-five per cent of the common road mileage of this country is unimproved, practically in the same condition, except some temporary improvements each year, as a half century or more ago.

THE GOOD ROADS MOVEMENT.

The present good roads movement has for its mission the revolutionizing of road methods and management. It recognizes that the present manner of managing road affairs in all the states, except a few in the eastern portion, will never provide an adequate system of permanent public roads; that more than a hundred years of experience has demonstrated this truth; that the countries from which we inherited our present system were forced to abandon them in order to secure a system of permanent public highways. The present system is wrong in principle and practice. It lays the burden upon the few for the benefit of the many. It is wasteful without business management, intelligent supervision and without permanent betterments as results. This movement endeavors to dignify the subject and urge its necessities upon the commercial and industrial as well as upon the agricultural interests. By some strange analysis and long custom road matters are left almost wholly to the people in the country districts. The cities and towns, although they garner the wealth from the farm and country and depend upon them for their food supply and to maintain their several crafts, trades and professions, still conceive that they have no concern for the public road or street, after it passes the town or city limits. The farmer or rural inhabitant on the other hand has grown into the idea that he has a private ownership in the public highways, that he has the sole right of their control and management. He is jealous of any interference on the part of the town people or the general public. He has a false fear that to even suggest their permanent improvement would be interfering with his property rights and lay a burden upon his lands. The farmer or the abutting land owner or the inhabitant in the rural district has no more sovereignty, right or use in or upon the public road than the man in the city or town or in a foreign state or county. It is not strange that the farmer should be apprehensive of any proposition to build what might be judged expensive permanent roads. The custom, so long in use of laying upon the lands and abutting property along the highway the entire burden of its cost and maintenance, is unjust and unfair. It is placing the burden of a general public improvement for the use and benefit of all, upon the property of a few. The farmer should bear his proportion and no more. The merchant and the tradesman, manufacturer and artisan, the bankers and the professional men, transportation companies and corporations who are equally benefited by this internal improvement should share in its cost and the responsibilities of its management. The common road is the property of all, for the use of all, for the benefit of all, and its cost should be shared equitable by all. The present movement is giving emphasis to this modern principle. It is appealing to the commercial and industrial interest of the country, urging them to awake to their relations and duties in the premises. It is certain that we will never provide a system of permanent roads until these interests recognize their responsibilities and take the initiative to secure them.

It is my experience after four years of active service in behalf of this cause that it is useless to hope for any permanent improvement in the public roads unless the business men demand it and are active for it. The farmer as a rule is in the rut and mud of the ages and must have a quickening forceful leadership.

NATIONAL AND STATE AID.

The countries of Europe which have and maintain splendid systems of public roads, the admiration of the American traveler, have secured them by abolishing the system of depending upon the local districts and providing for their construction and maintenance by the general government. There is a strong and growing sentiment in this country favorable to the national government lending aid in the construction of national, interstate and postal roads. There is a time-honored and shelf-worn theory in our government, called into action principally for opposition purposes, that the state is sovereign and exclusive in matters of internal improvement within their several jurisdictions. Therefore for the present, at least, we must look to the states for a system of permanent public roads. Some of the states, notably, New

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*Read at the Birmingham meeting of the N. B. M. A.

Jersey, Massachusetts, New York, and Connecticut have applied the modern principle of state aid, supervision and equitable distribution of cost and are making rapid progress in road building and extension. They have demonstrated the practicability of this plan and it is commanding increased favor with each succeeding year. It is the solution of the road problem for the states.

While there is some advantage each year in permanent road making, in local districts which is not to be discouraged, and a substantial sentiment aboard in the land for this necessary improvement there yet remains so much to be done, that it reminds us of the reply of an Irishman who was hauling water up out of a river. Some one on meeting him with his load said "Pat, how much water have you hauled up?" He said "All but what you see below there in the river." Viewing then this gigantic task, the necessity for strong advocates, and substantial supporters for its accomplishment, we return to our subject to inquire as to the part the brick industry should play in it.

BRICK ROADS.

The first paving bricks were made by the direct descendants of Noah on the plain or Shinar. The book of Genesis tells us that they said one to another "Go to, let us make brick and burn them thoroughly." This would indicate that they made a very good article of paving brick. They paved a highway leading from Babylon to Memphis and along it arose the great commercial cities of Nineveh, Palmyra, Damascus, Lyre and Antioch. No doubt brick was used for paving by the Israelites and the Egyptians although no special mention is made of it. The Ancients regarded brickmaking as the greatest of their arts. On one of the great pyramids built of brick, is found this inscription.

"Do not under value me by comparing me with pyramids of stone for I am better than they, as Jove exceeds the other Deities." The Greeks and the Romans understood the science and art of making brick, as their palaces, temples, baths and ancient walls still witness. In modern times Holland seems to be the first to use brick in the construction of her highways. She utilizes her dikes for roads, paves them with brick called klinkers, because they ring when knocked together. She has built a brick road from Utrecht to Connigham. What the Dutch have done for Holland, with her deep alluvial soil and without natural road material, the people of the Mississippi Valley may do or any others who have the requisite energy and population. It seems that the first brick street or road in the United States was laid in Charlestown, West Virginia, in 1872 and from it has evolved the great industry of brick pavement in many of our cities and towns.

The use of brick in road construction has been limited. You hear very little said as a general rule about the use of brick for country roads. They are not considered as a practical road material. This arises from lack of knowledge of their merits. I suppose our brickmakers have been absorbed in other departments of their industry and have failed to demonstrate to and impress upon the public the superior qualities of vitrified paving brick for country highways.

EXPERIMENTS IN BRICK ROAD BUILDING.

Some experiments have been made in brick roads in this country which illustrate the advantage of brick over other material and demonstrate their practical use for the purpose of road making. The most notable of these was made at Monmouth, Warren County, Ill. About ten years ago City Engineer Miller conceived the idea of combining a stone macadam foundation with a brick surface for country roads. The experiment has proved most satisfactory and Monmouth is justly proud of her excellent system of brick roads.

(I have a few pictures of these roads taken after 10 years' use, with little repair, which I will be glad to show to any one desiring to see them).

METHOD OF CONSTRUCTION.

The specifications followed in the construction of these roads is to bring the proposed roadway to the proper grade. The sub-grade under drained at low or flat places with a six-inch tile in the center and a four-inch tile on each side. The foundation is then cut out in the same manner as in the building of Macadam roads and thoroughly rolled with a ten-ton steam roller. It is given a crown about three inches from the center to the sides. A curb consisting of plain pipe boards, one by six inch, are placed on edge on the sides. The first course is then laid of crushed limestone to the depth of four to six inches after compact, as the character of the road, estimated by weight of traffic, requires. For this course, gravel, broken sewer pipe, slag and other like material may be used. This course to be properly laid, bonded and rolled. Upon this is placed the usual cushion of sand about two inches in thickness, properly spread, shaped and tamped in the usual manner. Upon this is laid the regulation size paving brick placed on edge, close together, crosswise of the road, alternating courses, breaking joints and fitting close against the curb, their surface being flush with the top of it. Dry, sharp sand is then spread on to the depth of about a half inch and swept into the voids between the brick. The whole to be then rolled to a uniform surface finish. The wooden curb is flanked or re-inforced on the outside with a strip of crushed stone or with gravel or slag, rolled down to requisite depth and sloping to the outer line. This beam or shoulder not only supports the wooden curb for the brick but affords an easy approach to the road enabling vehicles to pass freely on and off the brick road. It also has the effect of widening the hard portion of the road to the width of fourteen or fifteen feet, the brick wheelway being only nine or ten feet in width. This width being sufficient for all practical purposes. This method of construction may be varied to suit conditions. Concrete might be used in place of sand for filling voids and the sand might be bettered by having a portion of it ground to powder and puddled with the coarse portion. It has been suggested for light traffic roads, that the brick be laid flat-wise, thus making considerable saving in cost.

COST AND MAINTENANCE.

It may be stated that the first cost of brick roads at the present time is a little in excess of Macadam roads but when we consider the question of durability and maintenance with other advantages the economy of the brick road is very pronounced in comparison with the Macadam. It is well known from experience that Macadam roads constructed of limestone or similar rock with ordinary traffic and weather conditions sustain an annual wear and waste of about one half inch from their surface. This necessitates a considerable outlay for maintenance each year. Mr. M. O. Eldridge of the Office of Road Inquiries of the Government, to whom I am indebted for much of the data herein, states, "that from personal inspection the brick roads in the neighborhood of Monmouth, which were built in 1892, show no appreciable signs of wear, although from information given him they have had but little repair since construction." It is said that brick roads in Holland and the Netherlands which have had constant use for more than fifty years are still in good, sound condition.

ADVANTAGES OF BRICK ROADS.

The difficulty with the ordinary macadam road except those surfaced with a special quality of trappean rock is, that they will not endure the resistance of traffic, the action of wind, droughts and torrential rains. The same is true, as a rule, of gravel, chert, slag or shell roads. The combination of paving brick as a surfacing material guarantees durability and cheapness of maintenance. It is practically free from mud and dust, affords footholds for horses on heavy grades and insures ease of traction.

The brick road has particularly the advantage over other roads on the point of traction. It requires seventy-five per cent more tractive power to draw the same load over a macadam than over a brick road. One hundred and eighty-eight per cent more to draw the same load over a gravel road and three hundred and eighty-one per cent greater over a dirt road.

INSPIRATION.

The striking advantages and the actual experiences cited should inspire renewed admiration for the brickmakers' art and extend its usefulness to this neglected field of internal improvement.

Without considering the direct gain to your craft in financial and useful ways, what patriotic satisfaction in the achievement of providing a complete system of roads and highways for your country, made of the best material known to the art of man.

HOW CAN IT BE DONE ?

Granting the truth and force of the statement we would inquire, how can this be accomplished? What part should the brick industry play in it? Well! it is not so difficult a problem when once you have determined upon it. It is like any other business proposition or purpose that you wish to accomplish. Enter upon it with determination, make a beginning, it will solve itself and bring success. Make the subject of road improvement and its promotion one of the active departments of this Association. Establish and maintain a bureau with a competent head and assistants to educate and agitate for brick roads and street pavement. These roads and streets have the merit and will win when properly presented against all competitors. A reasonable sum contributed each year would maintain this bureau and the direct results would greatly exceed your best expectations.

CONCLUSION.

It was on the plain in the land of Shinar, that the Babylonians built their city of brick and reared a tower reaching to the heavens, and this, too, of brick. It is the only art of man that has reached from earth to heaven and called down a visit from the gods to admire its wonderful achievements. The Lord viewed these marvelous feats and the mighty Tower of Babel, built of dust and slime, fashioned into brick by the skill of man, and decreed that this wonderful and resourceful people should not live selfishly for themselves, but that their art should be spread to the world. He therefore confused their language and tongues, thus forcing them to carry their useful art to the uttermost parts of the earth. I covet now such magic power that I might confuse your absorbed interest to the other branches of your great industry and send you forth preaching the gospel of better roads. Brick roads if you will. Bring in closer communion the church, the school, the home, the farm, the factory, the store, the postoffice, the place of social concourse and amusement, making easier the way for righteousness, contentment and prosperity. Increasing the value of our lands, relieving our beasts of burden, regulating our markets, securing the advantages of city life to the rural home and blending the congested life of the city with that of the refreshing influence of the country. Adding to our commercial, industrial and agricultural progress, our comfort and pleasure. Embellish and beautify our country and surpass even England and France in the magnificence of our highways.

This is my earnest appeal to the patriotic brick manufacturers of America.

WORKHOUSE CAN BE MADE TO PAY.

Plans to make the Minneapolis, Minn., workhouse self-supporting and even a paying investment for the city are being considered by the board of charities and corrections. Its members have looked over the ground with a view to establishing a plant for making pressed brick and earthen flower pots and for a larger greenhouse. Under present conditions much of the labor available at "the works" goes to waste.

Brick experts say the clay on the grounds is excellent. The brick could be sold to the city for sewer construction and there has been a shortage in flower pots for six years.

The income from the present greenhouse is about $3,000 a year. As more than one-third of the supply of flowers for Minneapolis is shipped in, the demand would be practically unlimited. One department store manager guarantees to sell $10,000 worth of workhouse flowers a year.

The board of tax levy will probably be asked to make an appropriation for these improvements. If both are put in, only one or two men would have to be added to the guard force. There is already an experienced gardener and two men to oversee the clay moulding would probably be necessary.

Action will probably be taken at the next meeting.

HOW TO ESTIMATE THE COST OF BRICK AND ITS IMPORTANCE TO THE BRICKMAKER.*

By J. G. Hamilton, Grand Rapids, Wis.

When a man enters into a business of whatever nature, it is on the supposition that he is going to be able to make that business pay him good returns on his investment and labor. So when a man engages in the manufacturing of brick, his object is not only to make a large quantity of brick, but to make brick that are going to yield a profit on the investment. We may put it that he makes brick simply as a money-making, business proposition, and as a business proposition, the thing that should be taken into consideration first of all, is the cost of manufacture.

To begin with, the selling price of all articles, either staple or manufactured, is based entirely upon the cost. This relation between the cost and selling price forms the basic principle of all business transactions in fact; and yet, I believe I am safe in saying that fully 50 per cent of the brickmakers in Wisconsin do not know what their brick have really cost them when placed upon the market.

Perhaps these men do not realize the great importance to them of knowing what their brick cost; or perhaps they do not know how to go about to accomplish that end, and yet it is not a difficult matter. The first thing that is necessary is to open up an efficient set of books. If you do not understand bookkeeping, and do not feel that your business would warrant the employing of a bookkeeper, you can no doubt make arrangements with some clerk who would be glad to do your work evenings for a nominal sum, and I think you will find that he will save you his wages many times over.

It is a good plan, I believe, to open a labor account with each department of the yard, so that you may know just what the labor for every part of the work costs. The expense labor, by that I mean labor that does not properly belong to any particular department, should be kept by itself. You can then figure out to your own satisfaction whether it would be cheaper for you to let out part of the work by piece-work, or have it all done by day labor. Careful account should be kept of the fuel used each day in the boiler room, and of the amount required to burn each kiln. If driers are used they must be kept track of in such manner as you will know just what it is costing to dry your brick. An account should also be kept of the amount of brick turned out at the machine each day, and of the amount set in the kilns, so that you will know at all times the number of green bricks you have on hand, as well as the amount of finished product. Due allowance should be made for the loss by breakage in the kilns, which is usually an almost total loss, and with these data before you, it is an easy matter to determine at any time very close to what your bricks are costing.

Some of you may ask, Why go to all the trouble and expense of finding out all this? What particular benefit is it going to be to me anyway? There are at least two reasons why I consider this matter of knowing the cost of our brick of the greatest importance to us. The first is the assistance it is in detecting leaks and reducing the cost of manufacture. It is only by keeping careful account of the cost of doing a certain thing that we can expect to reduce the cost to a minimum. To illustrate: One burner is apt to use a great deal more fuel than another to obtain the same results in burning a kiln of brick. Unless we are keeping an account of the amount of fuel that each one uses, he will go right on using more fuel, and we will not detect the leak. It is the same in the boiler room. One fireman may use almost double the amount of fuel that another one would to keep up the same head of steam, but you will not realize it unless you are keeping track. The scoving is often taken off from a kiln and thrown down where it will be in the way in a short time and have to be moved again. The expense of moving that scoving a second time does not appeal particularly to the foreman until it is brought before him in black and white, and then he is going to be more careful where he has it dumped to begin with. And so I could go on and cite innumerable other instances where it is of help to us in detecting leaks and enables us to lower the cost of manufacture; but I believe I have given enough to make clear my point. Right here it might be well to bring out the advantage it is to us in keeping abreast of the times. We must know what it is costing to work our clay bank with picks and shovels before we can think of putting in a steam shovel and we must know what it is costing to burn our brick in the kilns that we are using before we can even contemplate the building of a continuous kiln. In fact if we contemplate installing any new device, which we believe will tend to lessen the cost of production, we cannot safely do so until we have figured out how much of a difference it is going to make in our particular case and whether that difference will be enough to warrant the extra expense. If you go into a yard where the most up-to-date methods of manufacturing are employed, you will invariably find that the business of the concern is conducted in a systematic manner.

The other advantage to us of knowing the cost is in the marketing of our product. We are called upon to compete to-day, not only with other clay brick, but with different forms of hollow concrete blocks, sand-lime brick, etc. Some of these I understand can be put on the market at a lower figure than we have been accustomed to get for our brick. We have yet to learn more of the relative merits of these products compared with brick, but the increase in the supply of building materials is going to increase the competition at any rate. If we expect to be able to compete successfully with these other materials, we must know first of all just what we can afford to sell our brick for. Determine just what your brick are costing; add to that the amount of profit you figure you should have, and you are in a position to name your price.

TO MAKE BRICK OF MAGNESITE.

Peter L. Kimberley and J. V. Rose, of Sharon, Pa., and G. Watson French, a director of the Republic Iron & Steel Co., of Chicago, have organized a company and will erect a plant at East Oakland, Cal., to manufacture brick and tile from magnesite.

The plant will cost $150,000 and the product will be used in steel mill and furnace construction. Mr. Rose is now west to assume the management.

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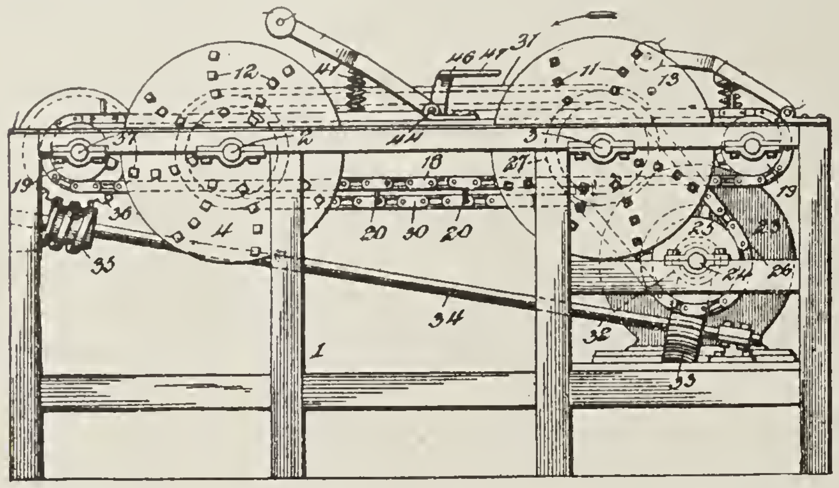
*Read at the Manitowoc meeting of the Wisconsin Clayworkers' Association.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

These new inventions are those that are especially of interest to any one engaged in the line of building materials and their manufacture, or machinery to make them.

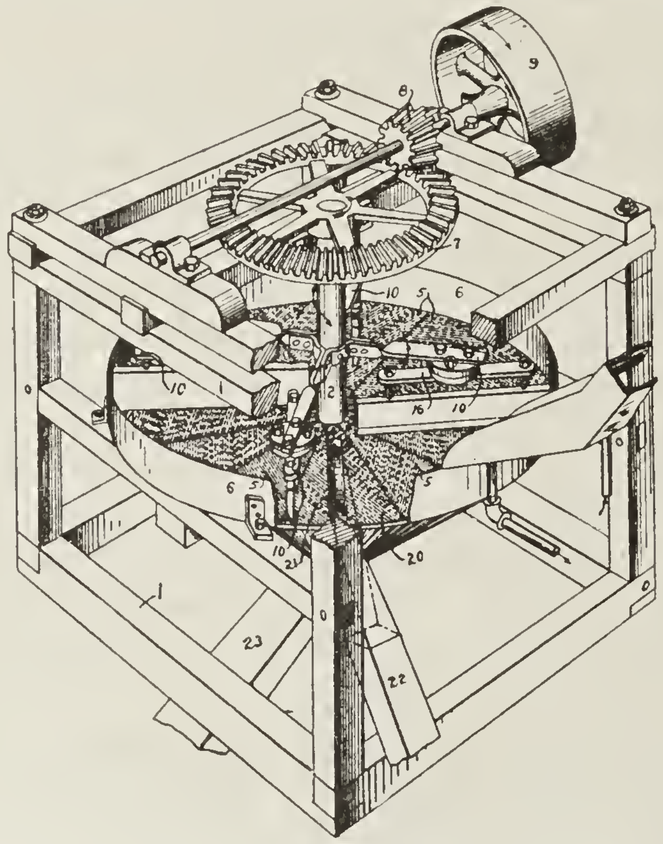
782,324. Brick-cleaning Machine. Max T. Christopher, Findlay, Ohio. Filed Jan. 15, 1904. Serial No. 189,218.



Claim.—1. In a machine of the class described, the combination of rotary cleaning devices arranged in pairs and provided with projecting spurs at their inner faces for engaging bricks at opposite sides thereof, one of the disks being provided with exterior spurs, and means for operating the disks, and for carrying bricks between the same, substantially as described.

782,581. Clay-Screen. Iverson H. Ross, Wadsworth, Ohio. Filed Aug. 25, 1904. Serial No. 222,039.

Claim.—1. In a clay-screen, the combination of a clay-pan, a series of segmental screen-plates adapted to constitute the bottom of the clay-pan, one of the screen-plates of the series provided with a large-sized aperture, a shaft adapted to rotate, said shaft provided with arms, disks carried by the arms, bars provided with disks, and the disks of the arms and bars pivotally connected together, scraper-blades carried by the bars, and springs interposed between the scraper-blades and arms fixed to said shaft and rotatable therewith, substantially as and for the purpose specified.

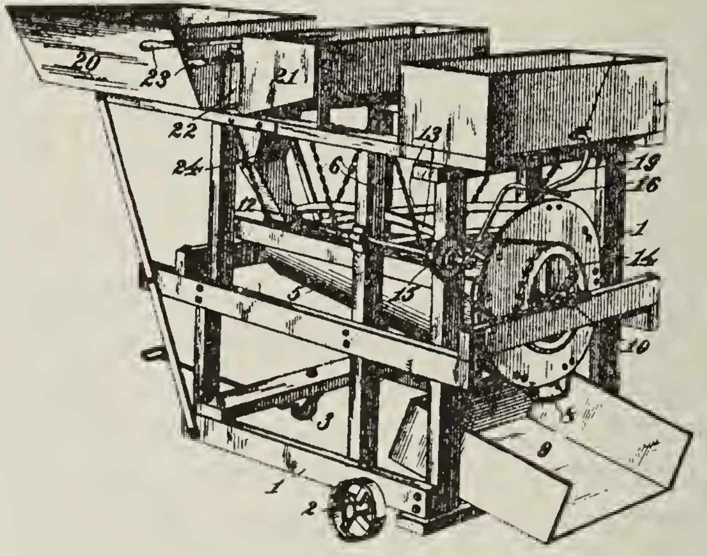


In a clay-screen, the combination of a clay-pan, of a suitable frame, said pan provided with a screen-bottom formed in segments and one of the segments having an aperture larger than the screen-apertures, scraper-blades adapted to rotate in a horizontal plane and in close proximity to the upper surface of the screen-bottom, said blades adjustable to and from the screen-bottom, and springs adapted to hold the scraper-blades in lowered positions, a rotating shaft and arms secured to said shaft, and means for adjusting the scraper-blades at an angle to the shaft, substantially as and for the purpose specified.

782,916. Composition for Brick, Tile, etc. William MaGuire, Toronto, Canada. Filed Oct. 29, 1902. Serial No. 129,282.

Claim.—A composition for a tile, brick or the like, composed of twenty-five to forty per cent. of magnesium chlorid, ten to twenty-five per cent. of calcined magnesite, about twenty-five per cent. of powdered glass and about twenty-five per cent. of sand or clay; all of said ingredients being mixed together in a liquid or semi-liquid state and permitted to set or harden to form a strong, durable and practically unbreakable article, substantially as set forth.

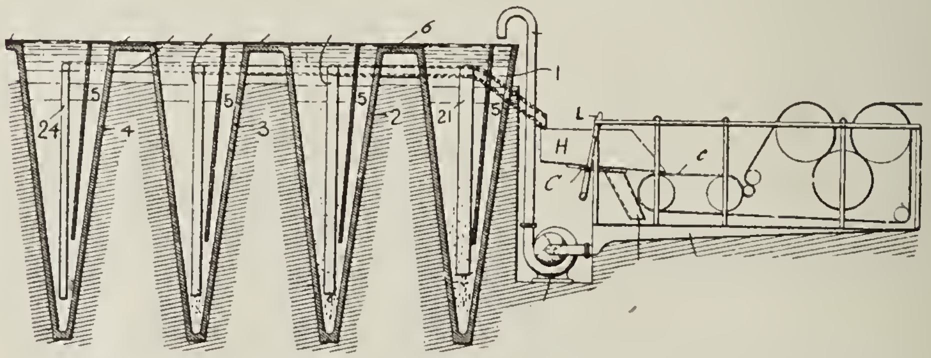
783,103. Cement-Mixer. Robert B. Coltrin, Jackson, Mich. Filed May 12, 1904. Serial No. 207,592.



Claim.—1. In a mixing-machine of the character described, a horizontally-disposed conical trough, and a rotating mixer therein having a conical contour corresponding to the interior shape of the trough, said mixer comprising a shaft with rigid end plates constituting the end walls of the trough and connected by spiral or twisted blades all disposed in the same conical surface.

A portable mixer comprising, in combination, a wheeled supporting-frame, a horizontally-disposed trough therein with its bottom downwardly inclined toward the back of the machine, a rotary mixer working in said trough, ingredient-chambers above said trough adapted to discharge thereinto, and a spreader located beneath the lower discharge end of the trough for receiving and spreading the admixture as the wheeled frame is moved along.

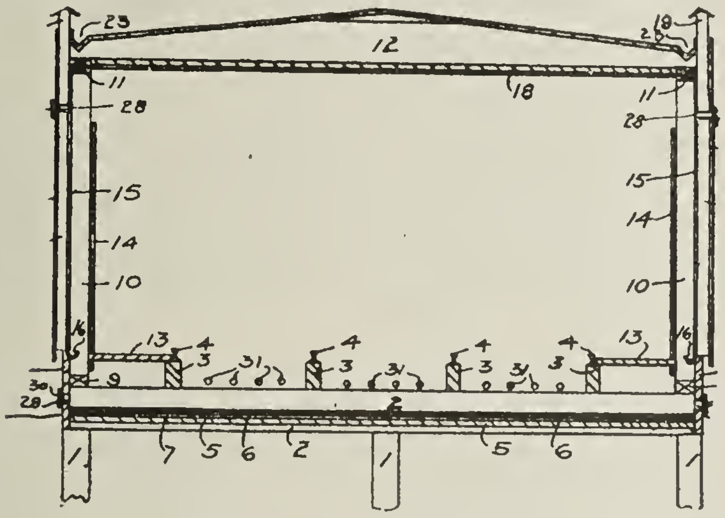
783,196. Separator for Separating Water from Cement, etc. Ludwig Hatschek, Vocklabruck, Austria-Hungary. Filed Sept. 13, 1904. Serial No. 224,297.



Claim.—In combination with a machine of the paper-making type for making plates of hydraulic cement and fibrous materials, apparatus for separating water from cement and fibrous materials, comprising a tank having a contracted bottom, an inlet to said bottom for the materials to be separated, a pipe open adjacent to the bottom and leaving said tank at a distance below its water-overflow line, and means for collecting the outflow from said pipe.

Apparatus for separating water from cement and fibrous materials, comprising a series of tanks, an inlet to the bottom of one tank for the material to be treated, a collecting-tank, a pipe extending from near the bottom of said tank, leaving said tank so as to enter the collecting-tank at a lower level than the water-overflow of said tank, means to collect the overflow and admit it to the bottom of the next tank of the series, which is similarly constructed and provided with a pipe to the collecting-tank, and so on, through the series of tanks, in combination with a machine of the paper-making type for making plates of hydraulic cement and fibrous materials, a trough to said machine to collect the waste liquid therefrom, and means to deliver it to said first tank of the series, and means to redeliver the liquid material drawn off by the pipes to the machine.

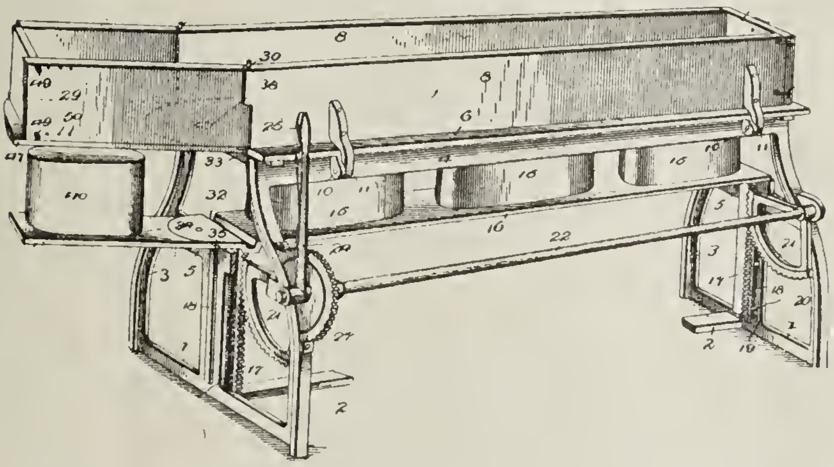
783,222. Drying-Kiln. John H. Regan, Tacoma, Wash. Filed Dec. 5, 1904. Serial No. 235,531.



Claim.—1. A drying-kiln, comprising a closed chamber having metallic side walls, interior partitions parallel with and close to said metallic walls but with air-spaces therebetween and being open at top and bottom to the interior of said kiln, and exterior shielding-walls parallel with and close to said metallic walls but with air-spaces therebetween.

A drying-kiln, constructed with its upper and lower closures of double layers of wood with non-conducting material between, and its side closures of metal; with partitions parallel with and close to said side closures said partitions being constructed of double layers of wood with non-conducting material between; and with exterior shielding-walls parallel with and close to said side closures.

783,016. Machine for Forming Building-Blocks from Plastic Material. Hiram J. Buchanan, Auburn, Ind. Filed Jan. 16, 1904. Serial No. 189,350.

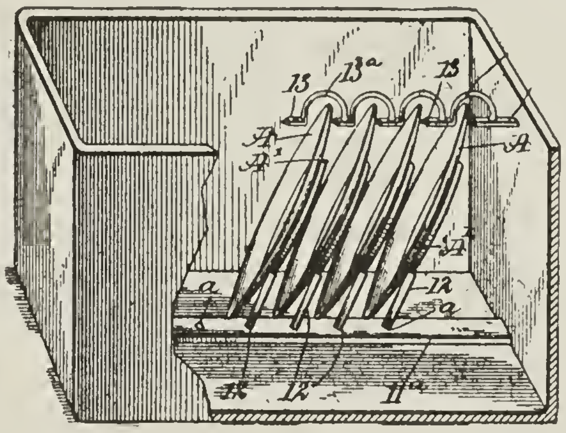


Claim.—1. In a machine of the character specified, a suitable supporting-frame; a bed-plate having a central opening or openings; side and end walls removably mounted on said bed-plate; vertically-movable cores and means to elevate and lower the same as desired, and an adjustable extension for said side walls adapted to form a building-block with an extension disposed at any desired angle, substantially as specified and for the purpose set forth.

In a machine for molidng building-blocks, a suitable frame, a molding-box carried by said frame and a core-carrying member adapted to co-operate with the molding-box, cores carried by said carrying member, said carrying member having a longitudinal slot 43 and curved slots 44 and 45 intersecting said longitudinal slot whereby said cores may be longitudinally and laterally adjusted relative to said core-carrying member and means to operate the core-carrying members, substantially as specified and for the purpose set forth.

783,948. Means for Supporting Chinaware in Glazing-Kilns. Fred G. Haney, East Liverpool, Ohio. Filed Mar. 9, 1904. Serial No. 197,271.

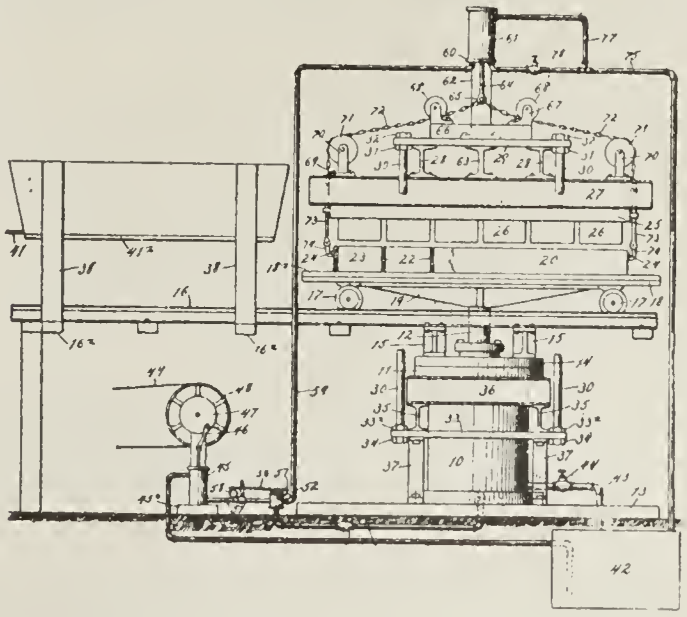
Claim.—1. The combination with a sagger, of a prop erected from the bottom of the sagger, and having a pointed upper end for engagement with the foot of a piece of ware, and means for supporting said piece of ware in the sagger.



The combination with a four-walled sagger, having spaced sockets in opposite side walls thereof, and rows of spaced sockets in the bottom of the sagger, of props having pointed upper ends and respectively bedded in a socket in a respective row of sockets, said pointed ends being adapted for engagement with the foot on a dish, and arms bedded in opposite sockets in the sides of the sagger, said arms having pointed ends for contact with the bottom surface of the dish near its edge, so as to support said dish nearly upright in the sagger.

783,442. Brick-Making Machine. Thomas S. Lawrence, Kansas City, Mo. Filed Oct. 31, 1904. Serial No. 230,847.

Claim.—1. In a machine for making brick, etc., the combination with a suitable frame of stationary dies, a mold-plate and a mold for the material, material-compressing mechanism for compressing the material in the mold, and a motor, motor-operated mold-lifting devices for raising said mold from the mold-plate, and means for transferring the power from the motor, actuating the material-compressing mechanism to the motor operating the mold-lifting devices when the desired pressure is reached upon the material in the mold.



CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,
Ninth Floor, Plymouth Building,
303 Dearborn Street,
CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.
Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVI. MARCH 30, 1905. No. 6

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

CLAY RECORD—semi-monthly—one dollar yearly.

While we should profit by the experience of others, we should try to be a little bit original ourselves.

If the manufacturer would keep as watchful an eye for the efficient service, the work especially well done, the evidence of personal interest and effort on the part of the employee, as he does for the traces of carelessness or neglect, it is possible there would be less dissatisfied employers and less indifferent workmen. *Try it.*

We note in the last issue of the Hoosier contemporary an open letter to the Editor of the CLAY RECORD, but as it has always been our policy to withhold all petty personal matters from the columns of our paper, thus inflicting an unpleasant subject on our readers, we refrain from replying or deviating from our custom at this late date.

We are not advertising gratis, and especially so to one seeking same in this, our 306th number, nearly fifty more than that of any other Clay journal published in America.

We have had occasion before to comment on the treatment of brickmakers by their townspeople, when in the growth of the town the brick yards are surrounded by dwellings, in aiding and abetting the action of a council declaring the brick yards a public nuisance, thus putting them out of business. During the years the towns were growing the yards were doing business, employing men, paying salaries and wages, distributing capital, all contributing to the general prosperity, but this is all forgotten. The town could spread in other directions but some real estate concern buys surrounding property, builds houses, offers inducements and houses are disposed of. Little or nothing is heard then about the brick yard being a nuisance, or if it should happen any one advanced such a criticism he or she were told to say nothing, but to keep quiet, being assured that when the neighborhood was built up it had all been arranged to appeal to council to abate the nuisance, therefore they could abide the time seeing they were getting a bargain now in the prices paid and much profit by the advance in realty in the future, in short a pure and simple scheme of selfishness on the part of all parties concerned. The men who suffer are the owners of the yards, being driven out of business.

Our contention is no town can afford to treat any industry in its midst in that manner. Its industries are making the town, and while granting some inconveniences may arise because of them, the fact remains nevertheless true that these should be borne for the sake of the good done in the past and being contributed in the present.

Some one has said if you know the newspaper a man regularly reads you can determine his politics without further questioning anyone or the man. You know upon which side of the shield his gaze will be fixed, and that he will not, cannot, know what is on the other side. In other words, such an one at most has but half the truth. It is this possession of but half the truth, and the unwillingness to learn and possess the whole truth, that explains the existence of the misunderstandings, misconceptions and misjudgments everywhere visible in civil life. Take any subject, say, the ownership of public utilities. Certainly, in regard to these the interests of one are the interests of all, and vice versa. Why, then, should the problems in these matters be considered from the Socialistic, the Democratic, or the Republican standpoint? Is it not the problem to get at the truth, and apply it? These reflections came up as we were thinking over the question, which question, like "Banquo's ghost," will not down: Should prison labor be permitted to compete with free labor? or, to put the question in a more practical and concrete shape; Should brick made by prison labor be sold to contractors in competition with materials made by free labor, where these materials go into construction work outside the prison walls?

The whole, and nothing but the truth in this question lies in the principle that under no circumstances should prison labor ever be in competition with free labor. This principle applied, as it should have been, at the beginning, this question had been buried long ago and never resurrected, as it has been, all because of two elements: the selfishness of the contractors; the other, the maudlin, misplaced and uncalled-for sympathies on the part of the prison reformers, so-called.

The first element should be entirely disregarded on the ground that the interests of the many must not be sacrificed for the benefit of the few, and as regards the latter our contention is, that those who enter the penitentiaries as criminals are degenerates and all sympathy in their behalf is wasted effort and misapplied; that if sudden death be cruel, then let them perish by slow death, as someone has described it if they are not given employment. The sickly sentiment towards criminals exhibited by so many is a blot on civilization. The criminal in these days is made a hero and draws crowds wherever he is exhibited, and his vanity is aroused. What effect has all this on budding criminals? A man charged with a crime from the beginning should be taken out of sight as completely as if buried in Calvary the effect of which would act as a deterrent to many, but whatever the opinion may be as to this mode of treatment, it should not be, and must not be, possible for any work of his hands to enter into competition with the products of free labor.

FIRES, ACCIDENTS AND DAMAGES.

The American Sewer Pipe Co., Pittsburg, Pa., has been made defendant in a suit for damages by the Lawrence Cement Co., of Philadelphia, because of an alleged breach of contract.

Wm. Gueber has filed a suit to collect $5,000 damages from the Laclede Fire Brick Company, St. Louis, Mo., because of alleged injuries in driving a "bad mule" owned by the company.

The Topeka (Kansas) Pressed Brick Co. are now defending a suit for damages brought by an employe who caught his hand in the dry press and lost three of his fingers; afterwards blood-poisoning set in.

The Ashton Fire Brick Co.'s plant, So. 8th and W. 3rd Streets, Salt Lake City, Utah, was visited by a disastrous fire, causing a $16,000 loss. Insurance $4,000. The main building containing the machinery and stock was destroyed.

SEWER PIPE MEN HAVE REORGANIZED.

Sewer pipe men have reorganized the Sewer Pipe Association of the United States. The organization is practically the same as the one which has heretofore been maintained, but for a number of reasons the form is changed. The reorganization was effected in New York, Feb. 21st.

George R. Hill, of Akron, O., vice-president of the American Sewer Pipe Co., was re-elected president. He has held the same office, being the first executive head of the association. A vote of thanks was tendered him for his excellent services.

For some time the independent sewer pipe men and the American representatives have been trying to get together in a renewal and extension of the pooling agreement which recently ran out after having lasted three years. The reorganization of the association and the change of its form, was made to accomplish the same result and still steer clear of possible governmental interference in the pooling arrangement. The reorganization means that the selling pool has been effected and that there will be no ruinous competition between the independents and the combine.

BRICKWORKERS DEMAND INCREASE.

Local unions of brick, tile and terra cotta workers in Chicago and Cook County have voted to ask for an increase of 10 per cent in wages from the Illinois Brick Company.

As that corporation, which practically employs all of the 1,500 members of the unions, is engaged in conflicts with other brick manufacturing interests the men are preparing to fight for their demands if they are not granted.

The wage agreement does not expire until May 15, but it is provided in the present agreement that either side desiring a change in the wages must serve notice to that effect ninety days in advance.

BRICKWORKS ENGINEERING.

The above name is the title of a booklet that is now in its second edition. It is written by Willard D. Richardson, A. M., Columbus, Ohio, who is the first engineer in this country to take up this work as a profession.

The examination of clay deposits, brick works' construction, dryers, kilns, furnaces and superintendence, are all treated upon. If you are about to make some changes in your plant, enlarge its capacity, increase the kind of goods made, etc., it might be of help to you to consult the author of this booklet, or even to receive a copy of it. It is sent postage free.

McNEILS GET BRICK PLANT.

The Leeds Brick Works, Sioux City, Iowa., has changed hands, having just passed into control of H. C. McNeil and his son, Wilber C. McNeil, who will operate it to its full capacity, turning out 20,000 brick per day and giving employment to from twenty-five to fifty men.

The plant has been closed down for a year past. It is situated about a half mile east of Leeds and was owned by a corporation composed of W. B. Lower, A. L. Stetson and C. Nelson. Mr. Stetson went to California to live and Mr. Lower has had his hands full in looking after his other brick yards.

The McNeils have purchased all of the stock of the corporation and will start the plant about April 1. The corporation is known as the Leeds Brick Works. H. C. McNeil is president. Mr. Nelson, who formerly owned a one-third interest in the property, will become the superintendent of the plant.

LOWEST RATES EAST

are afforded via the Nickel Plate Road. With solid through trains to New York City and intermediate points, via both Lackawanna and West Shore Roads, and to Boston and other New England points, via the Nickel Plate and West Shore and Boston & Maine Roads, travelers via that popular low rate line are offered all modern conveniences. Excellent dining car service, meals being served in Nickel Plate dining cars on American Club Meal Plan, ranging in price from 35c to $1.00. No excess fare charged on any train on the Nickel Plate Road. Chicago depot, Van Buren and La Salle Sts., the only railroad station in Chicago on the Elevated Railroad Loop. City Ticket Office, 111 Adams St. 'Phone Central 2057.

IMMEDIATE RAISE IN CEMENT PRICES.

As a result of a meeting of representatives of the Central Cement Association in Detroit, Mich., the price of Portland cement in the middle west will be raised 10 to 15 cents a barrel at once. This will make the price at Detroit in carload lots to jobbers about $1.21 a barrel.

All of the 17 factories in the association were represented at the meeting, 14 personally and three by proxy. In the Central Cement Association are embraced plants in Michigan, Indiana and Ohio, which make cement from marl. The president is Charles F. Wade, who is secretary-treasurer of the Omega Portland Cement Co., whose factory is situated at Jonesville, Mich.; the secretary-treasurer of the association is John A. Myers, also secretary-treasurer of the Aetna Company, with factory at Fenton and offices in Detroit.

"A discussion was had of the demoralizing conditions of the trade for the past 18 months," said Mr. Myers, "and while there was no united action as an association, it was the general opinion that in view of the phenomenal demand for cement which had manifested itself as a result of the unprecedented and unusually early building boom, a general advance on all brands was advisable. The mildness of the season has stimulated the demand earlier than usual. Eastern mills are hardly able to care for the demand from the large eastern cities like New York, Baltimore and Philadelphia, and the mills of the middle west all have light stocks on hand. The production of the mills in the middle west will hardly care for the consumption this season."

The following Portland cement companies are members of the Central Cement Association: From Michigan, Aetna of Fenton, Alpena of Alpena, Great Northern of Marlborough, Elk Rapids of Elk Rapids, Newaygo of Newaygo, White of Chelsea, Wyandotte of Wyandotte, Wolverine of Coldwater and Quincy, Bronson of Bronson, Peerless of Union City, Peninsular of Jackson, Omega of Jonesville, Egyptian of Fenton. From Ohio, Castalia of Castalia, Buckeye of Bellefontaine. The Wabash of Stroh, Ind., is also a member.

The price of $1.21 to jobbers in large lots will doubtless be increased by five cents a barrel in small lots to small dealers. A peculiarity of cement prices in this section is the fact that all prices are f. o. b. delivered. Differences in freight rates at the various locations cause innumerable fluctuations in prices.

LABOR-SAVING DEVICES BY BECHTEL.

Brickmakers are all looking for lavor-saving devices and Bechtel Bros., Waterloo, Ontario, have just got out a catalogue (which is free for the asking) describing many good labor-saving devices for clayworkers. The Perfect carless open dryer and the trucking system is the first among them. Bechtel's Centrifugal Disintegrator and Stone Separator is another with recognized merit. Their rotary automatic end and side cut tables are used by many Canadian manufacturers and quite extensively in the States. Testimonials as to the value of all these labor-saving devices are chronicled and the high class that they are speaks well for the company.

GEORGIA BRICK MANUFACTURERS ORGANIZE.

The brickmakers of Georgia stole a march on Augusta and had a convention in the city without having had any previous notice given to the public.

They came from many places, met at the Albion hotel and elected Captain Ed. L. Wight, of Albany, Ga., president; H. L. English, of Atlanta, Ga., vice-president, and W. E. Dunwoody, Macon, Ga., secretary and treasurer.

Besides the officers there were present W. J. Cruger, Albany, Ga.; A. J. Baldwin, Eufaula, Ala.; A. H. Bickerstaff, Columbus, Ga.; J. C. Fain, Atlanta, Ga.; W. J. Massee, Macon, Ga.; Charles F. McKenzie, W. E. Jackson, Jr., H. H. Stafford, A. H. Merry, A. H. Davidson, R. B. Morris, of Augusta, and J. L. Hankinson, J. C. Hoyler, J. S. Phelan, L. H. Hankinson, Jr., B. S. Dunbar, R. D. Branch and Steiner Branch.

The organization was formed for the purpose of more thoroughly regulating the brick business, the regulation of freight rates, the betterment of the product generally and for social as well as business intercourse among the manufacturers of the state.

After the business session the visitors were entertained by the local members at the Elks Club. President Cabaniss and Secretary Nees, of the Augusta chamber of commerce, were among the invited guests. After the luncheon there was a ride to North Augusta and a visit to the beautiful Hampton Terrace hotel.

A REVERSIBLE FAN AND ONE PIECE FAN WHEEL.

In its new sectional catalogue No. 58 the New York Blower Company describes its Reversible Fan and one-piece fan wheel. After years of innocuous desuetude, we have here at last something new in the construction of fans. The wheel is virtually one-piece by having the sheet steel vanes cast into the wheel cone, making it smooth, solid, lasting and effective. The pulley can be placed either on the right or left hand side of this fan and the discharge opening can be pointed in any direction. Wood working establishments, especially, will be delighted to have at last, a fan as the one described in the above catalogue.

When writing, address the New York Blower Company, 25th Place & Stewart Ave., Chicago.

THE OHIO CERAMIC ENGINEERING CO CATALOGUE.

The annual catalogue of the above named firm is now being sent out. It illustrates all the standard types of cars that this company manufactures at their Cleveland, Ohio, factory.

The cars are built entirely of steel, with the exception of the wheels and bearings, which are made of high-grade cast iron. Strength, rigidity with lightness, and yet ability to stand the wear and tear, has been the main idea when building these cars. Turn-tables, trucks and dump cars are also made in many styles. Represses, both hand and power, and sand cement brick presses, are also made by this well-known corporation.

CAPITALISTS VISIT THE PERKIOMEN BRICK PLANT.

President A. A. Gery of the United States Brick Co., met a distinguished lot of capitalists from New York and Philadelphia at the Reading Terminal in Philedelphia on Saturday the 18th inst.

Later the party who were the guests of Mr. Gery and others interested in the company, boarded a special train consisting of an engine and two coaches and proceeded to the company's large plant near Perkiomen Junction.

The object of the visit on the part of the visitors was to inspect the process of making brick and the facilities of the company at that place with a view of establishing a similar plant along the Hudson river about 10 miles from Catskill, N. Y.

Every one of the party expressed surprise when informed of what was being accomplished at the factory and all being men of wealth, they have decided to go ahead with the New York plant. It will be four times the size of the one at Perkiomen.

It will be constructed along the same lines, only that it will be larger and take in several patents that have just been taken out by Mr. Gery. The factory will be built near the river and will have the best of facilities for shipping its products.

After the visitors had thoroughly inspected the works they again boarded the special and returned to Philadelphia, where they were entertained at an eleborate luncheon at the Bellevue-Stradford by Vice-President B. Dawson Coleman, of Lebanon.

The visitors represent many millions of capital. It was not a trip of pleasure but purely for business.

After the return to Philadelphia there was a general discussion of brick making and the question of erecting the big New York plant was determined upon then and there.

In the party were: Cornelius Vanderbilt, Jr., Perry Belmont, Delancey Nicoll, George W. Young, president of the United States Mortgage and Trust Company, who recently purchased a seat on the New York Stock Exchange for $83,000, the record high price, of New York; Arthur Brock and B. Dawson Coleman, of Lebanon; Robert E. Brooke, of Birdsboro; Mr. Page, of the Standard Oil Co., New York; Mr. Tatin, of Boston; Messrs. McCallister, Alex. De Haven, Mr. Morris, J. H. Weaver and H. S. Kerbaugh, of Philadelphia; A. A. Gery, Richmond; L. Jones and Wilson Ferguson, of this city.

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WHITE GOES TO A KANSAS BRICK CO.

Frank White, for several years with the Barber Asphalt Company and the Capital City Brick and Pipe Company, Des Moines, Ia., resigned to enter the brick manufacturing business in Kansas, near Fredonia. The company with which Mr. White will be connected is the Fredonia Brick Company, and 22,000,000 building brick were turned out by their plant last year. The yards are situated twenty-five miles north of Coffeyville, Kansas. The Fredonia is one of the largest exclusively building brick plants in the world.

SUITABLE CLAYS FOR BRICK MAKING.

Luis Jackson, Industrial Commissioner of the Erie Railroad System, reports that there is clay suitable for brick making, etc., at the following points on the line, and the parties named will be glad to correspond in regard to the deposits:

New Hampton, Orange Co., N. Y. Frederick W. Sparkman. Good clay for facing brick.

Narrowsburg, Sullivan Co., N. Y. Jeremiah Partridge. Claims fine deposit of blue clay.

Honesdale, Pa. E. B. Callaway, Secretary of the Honesdale Board of Trade. Variety of clays suitable for pottery and general work.

Lanesboro, Pa. Chas. M. Taylor says shale deposit suitable for vitrified brick.

Hutchins, Pa.,; Carlton, Pa. Geo. V. Adelman, P. O. Box 74, Franklin, Pa.; says fire and other clays for buff building brick.

Gowanda, N. Y. Quigley & Place. Fine shale clay for building and paving brick.

Braceville, O. Homer Crook. Shale clay for building blocks, brick and sewer pipe; also, soft clay for manufacturing brick.

Mansfield, O. Le Roy Parsons, Secretary, Chamber of Commerce. Good quality of shale clay for brick.

Springfield, O. Jas. H. Long, Secretary, Commercial Club. Fine clay of porous nature, especially adapted for hot house pottery.

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PUTTY COMPANY INCORPORATES, CLAIMING TO HAVE NEW PROCESS OF MANUFACTURE.

The Kaolin Putty Company filed articles of incorporation in the County Clerk's office, Louisville, Ky. The company is capitalized at $200,000, and the incorporators are G. K. Hikes, a contractor and painter; J. P. Venable, president of the local painters' association; W. F. Gregory, all of whom are of this city, and T. Nadeau, of New York. Mr. Nadeau is the owner of the patent process, which will be utilized and which was invented by a New York man. The company owns mines near Macon, Ga., where the kaolin will be mined. A factory will be located in Louisville and also one in Macon, where the product will be manufactured.

Officers of the company will be elected as soon as possible, and business will begin shortly. Mr. Nadeau will be in charge of the business here, and he says that the putty factory will be a valuable addition to the business interests of Louisville. He says the company will enlarge its capital stock to $1,000,000 within the next year.

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BROKE RECORD AT WESTERN BRICK CO.

Machine No. 2, with Harley Williams as temperor and with Steve Strange at the wheel, broke a record at the Western Brick Co.'s plant at Danville, Ill., March 14. In the interval between 7 a. m. and noon the machine turned out 90 cars of brick or 58,000 brick in a half day. The usual run is seventy cars.

SAND OR LIME-BRICK OR BLOCK NEWS.

Joseph Shimek, of Renville, will start a cement brick factory at Appleton, Minn.

The Waterloo (Ia.) Concrete Brick & Block Machine Co. has been incorporated with $60,000 capital stock.

McCracken & Neadstine, Mound City, Ill., are manufacturing building blocks and brick from cement and sand.

The Menominee (Mich.) Brick Co. have let the contracts to local contractors to build their plant ready for the machinery.

O. B. Ekman and O. A. Rice, Roseau, Minn., will start a pressed stone and brick plant as soon as the machinery arrives.

The Diamond Stone Brick Co., Wilmington, Del., since it began operations last fall, has been making brick at the rate of 18,000,000 annually.

Corning, Tehama County, Cal., is to have a cement brick factory. It will be managed by Hiram Confer, who has already ordered the machinery.

Ed. Bridges, a Wabash, Ind., contractor, has bought the plant of the American Cement Brick Company, of Cincinnati, and will operate same.

The Lake Superior Sand-Lime Brick Co., Calumet, Mich., will start up as soon as the weather will permit. Many good orders have been booked.

The Sandy Hill Brick Co., Ft. Edwards, N. Y., has increased its capital stock and will put in a drying plant so as to enable them to run all the time.

The Sebewaing (Mich.) Sandstone Brick Co.'s plant has been closed down so as to put in a new brick machine which is just double the capacity of the old one.

The Lime and Sandstone Brick Co., Hummelstown, Pa. owned by Walton Bros., have started the foundation for their plant. John Whitcock will be the superintendent.

The B. V. Concrete Co., Terre Haute, Ind., has been incorporated, with $5,000 capital stock. Directors are Jacob E. Vorhees, E. V. Vorhees, D. B. Bolinger and A. H. Vorhees.

The Janesville (Wis.) Granite Brick & Stone Co. has been incorporated, with $35,000 capital stock, and completed its reorganization. The incorporators are James Shearer, Grant Fisher and James Lamb.

J. A. Waterworth, of Duluth, Minn., has entered into partnership with Frank Helm and S. S. Williams, of Traverse City, Mich., for the sale of their cement brick machines west of the Mississippi River.

The Chesapeake Sand, Gravel & Brick Co., Asbury Park, N. J., has been incorporated, with $100,000 capital stock. Incorporators, C. C. Goodwin, 238 5th Ave., New York; N. H. Kilmer, Ocean Grove, N. J., and Richard S. Bartine, Asbury Park, N. J.

The Missouri Granite Brick Co., Joplin, Mo., has been incorporated with $160,000 capital stock. The shareholders are A. T. Callison and W. S. Smysor of Windsor, Ill.; W. C. Johnson of Danville, Ill.; C. C. Buckingham, A. V. Boswell and B. B. Howard, of Joplin.

MISCELLANEOUS ITEMS.

W. I. Lyman, Box 347, Jacksonville, Fla., is to build a brick plant at that place.

J. C. Richards and E. E. Sivey, Englewood, S. Dak., will locate a brick plant near the station.

The Monarch Brick & Tile Co., Caney, Kan., will start soon on their large brick making plant.

Peltier & Ryman, Aitkin, Minn., have put in additional power and machinery to their brick plant.

B. Froning has bought a one-half interest in the Tony Niekamp Tile Works at Chickasaw, Ohio.

L. H. Carlisle, Anoka, Minn., will have charge of the Coon Creek Brick Works, which will be started soon.

The Franklin Brick Co., Columbus, Ohio, will erect a plant in Jefferson township to make 75,000 brick daily.

J. H. McKnight, 123 W. 27th street, Los Angeles, Cal., expects to start a plant at El Paso, Texas, to make brick.

The new plant of P. B. Broughton & Co., Bradford, Pa., at Lewis Run, is completed and is a modern plant in every respect.

John Lewis & Childs Bros., Marion, Ala., have organized a company and are equipping a plant to manufacture 40,000 brick daily.

W. W. Perkins and Ed Martin have arranged to open up a brick yard at Lawrenceville, Ill., as soon as the weather will permit.

The Scandia Brick & Tile Co., Madrid, Ia., have added much new machinery to their plant and are now installing a waste heat dryer.

The Bostick Brick & Mfg. Co., Meridian, Mich., has been organized with $40,000 capital stock by T. J. Bostick, E. S. Bostick and others.

T. J. Eubanks, Concord, Tenn., and others, are trying to organize a brick company to work the fine clay recently found on their land.

W. H. Horrum, Auburn, Neb., has bought 40 acres of land on the Missouri Pacific tracks and will move his old plant to the new location.

Dr. Wm. Cluthe and George Dickmann, Tell City, Ind., have formed a partnership for the manufacture of brick. Machinery has already been bought.

Lewis Ismay and brother, formerly of Fulton, Mo., have leased the old plant on the Reserve at Ft. Smith, Ark., and have refitted it and will soon start it up.

L. C. Besley, Council Bluffs, Iowa, has found some clay that will make dry pressed brick and it is quite likely that a dry press brick plant will be installed.

Smith & Spencer, Portsmouth, Ohio, have received machinery so as to make 40,000 brick daily. Their plant is located at the mouth of Lawson's Run.

The Builders' Brick Co., Hempstead, Nassau Co., N. Y., has been incorporated with $125,000 capital stock. Directors are W. H. Wayne, A. P. Smith, J. O. Briggs, William A. Ball and R. M. Price of Brooklyn.

J. T. Dean, Bearden, Tenn., has bought land and will build a $20,000 brick plant.

The Blanchester (O.) Brick & Tile Co. has increased its capital stock from $15,000 to $30,000.

The Ireton (Iowa) Brick Works are now in the possession of W. I. Knowlton, Byron Peebles and W. A. Townsend.

The Des Moines (Ia.) Clay Mfg. Co. is making some big improvements to its plant on S. 8th street; $20,000 will be expended.

The Arthur B. Nitsch Brick plant, at Lansdowne, Baltimore Co., Md., was sold at public sale for $22,600 to R. A. McCormick.

L. E. Fox, Mendon, Ohio, is going into the tile business again on the old site on his farm. He will put in the latest and most improved machinery.

The Wallace Manufacturing Co., Frankfort, Ind., are having all they can do to keep up with the recent orders they have received for their "Wonder Machinery."

The Corydon (Ky.) Pressed Brick Works, of which J. L. Jones is president and treasurer and C. F. Jones secretary, will have their new plant in operation about May 1st.

A. A. Gery, president of the United States Brick Co., Reading, Pa., has purchased 80 acres of land on Biscayne Bay, Miami, Fla., and will build a brick plant there later.

The Bergman Clay Mfg. Co., Spokane, Wash., has been incorporated with $25,000 capital stock, by M. L. Bergman, J. A. Hurd, J. T. Davie, J. H. Evans and Peter Erickson.

The Barber Asphalt Co. has taken up its option on the Capital City Brick & Tile Co.'s plant at Des Moine, Ia. They have operated the plant under lease for three years.

Wm. H. Maybury, commissioner of Department of Public Works, Detroit, Mich., has advertised for a municipal brick plant equipment, proposals to be put in by March 31, 1905.

Thos. M. Wilson, 503 Market St., Pittsburg, Pa., is meeting with all kinds of success with his kilns and dryer. He is doing much work in the Pennsylvania and Ohio district.

The Garfield (Ohio) Brick Works has been sold to Cleveland, O., capitalists and brick manufacturers, and the plant will be greatly enlarged. A. Sieberstein is one of the principle owners.

Geo. W. Ward and several Kentucky and West Virginia gentlemen have in view the opening of a new brick works at Ironton, Ohio, and will probably secure land in Whitwell for this purpose.

The Hauser Company, 271 Madison Street, Chicago, have a perfect clay-handling system that is being investigated by many of the high-class brick concerns of this country. Make inquiries about it.

A company composed of Wm. B. and Dennis C. Dempsey, of Newcomb Hook, N. Y., and Albert T. Gabriels, of Watervliet, has secured a long lease on a brick plant at Crescent, owned by W. K. Mansfield. They will enlarge the plant.

The Maben (Miss.) Brick Plant is now laying a switch to the Southern Ry. and the machinery has arrived.

The New England Brick Co., Boston, Mass., have put a number of their yards in operation for the season.

The brick yard employes of Mason City, Ia., will run Wm. Van Lone for alderman of the fourth ward in that city.

John Frazee of Warren will locate a brick factory at Van Buren, Ind., where he operated a plant two years ago.

The C. W. Raymond Co., Dayton, Ohio, report business in splendid shape, several new complete plants having been sold.

W. E. Caldwell Co., Louisville, Ky., can save you money when you are ready to put up a tower and water tank. Write to them and mention the Clay Record.

The cement plant of the Illinois Steel Co., at Chicago, is to be doubled. The company has secured a contract to furnish cement for the Panama Canal, and 800 men will be employed at once.

James W. Hensley, Indianapolis, Ind., comes before our readers this month for the first time. He is an "old-timer," but new to us. Soft-mud machinery is his line. Write to him direct if interested.

The McArthur (Ohio) Clay and Cement Block Co. has been incorporated with $50,000 capital stock. The incorporators are Frank E. Mohr, J. M. Moore, John Best, Chas. B. Westcoat and J. Thompson. The plant will be built on the Mohr-Minton Coal Co.'s lands.

FOR SALE OR LEASE.

Largest and Best Equipped Plant in the Country for the Manufacture of White and Light Shades of Vitrified or Impervious Front Face Brick.

Plant is in close proximity to practically unlimited supplies of white clay, and in addition to facilities for manufacturing white and light face brick, has complete clay washing or refining outfit.

Best of Reasons Given for Selling or Leasing.

An Exceptional Opportunity will be Afforded to Interested Persons.

Capacity of the plant is 5,000,000 per annum. A wide introduction has been secured among the leading architects and builders of the country, with an unlimited demand for an increase of the output.

Every facility will be afforded for an examination of the plant.

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For further particulars, address

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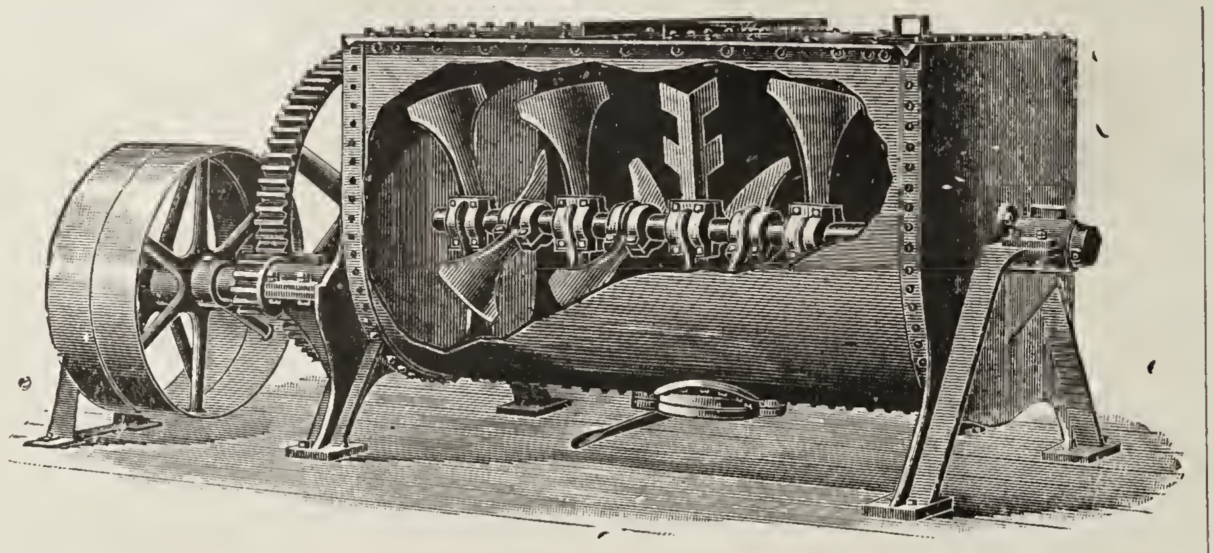

MIXERS, DRYERS, CONVEYORS AND ELEVATORS

The C. O. Bartlett & Snow Co., Cleveland, Ohio, U. S. A.

FOR SALE.

Sand-Lime Brick Factory, in progressive Southern seaport city of over 25,000 inhabitants. Finest climate in the world. Factory in full operation. Over 2,000,000 brick made and sold. Inexhaustible supply of sharp sand. Shipping facilities unsurpassed. Plant costing $30,000, located on entire city block, 330x330 feet. $6,000 new machinery just added. Reason for selling, owners are engaged in other business and cannot give this their personal attention.

OPPORTUNITY, care Clay Record.

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Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

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FOR SALE.

Good Brick and Tile Factory. Good clay, good railroad facilities, and good field especially for tile.

B. P. C., care Care Clay Record, Chicago.

FOR SALE.

White Glass Sand or Sand Brick Property, near St. Louis, Mo.. Situated on two roads. All facilities. Switches on property. Address

M. S. G.,
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FOR SALE.

Brick and tile plant. Stiff Mud. Continuous kilns. Steam dryer. Good clay and excellent market.

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Cherokee, Iowa.

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20,000 fine pallets. $30.00 per thousand, F. O. B. cars here.

JOHN BUCKLEY,
Frankfort, Ky.

NEW AND SECOND-HAND MACHINERY FOF SALE.

One No. 6 Machine, capacity 50 to 75 thousand brick per day.
Three "Eli Jr." Brick and Tile Machines.
One "Little Eli" Brick and Tile Machine.
One No. 1-A Brick and Tile Machine, with square hopper.
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Two No. 2-B Brick and Tile Machines, with square hopper.
Two No. 5 Disintegrators, capacity 40 to 60 thousand per day.
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Three Winding Drums or Hoists.
One "D" Freese Tile Machine, second-hand.
One 30 h. p. Engine.

Above machinery is same as new and will be sold cheap. It is guaranteed to be as represented in circulars mailed on request.

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FOR SALE.

50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets Track gauge 25 inches.
Both styles of cars in first-class repair.

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GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine. Address

"GIANT,"
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FOR SALE.

1 Raymond Victor double die steam repress.
1 Raymond Columbian double die steam repress.
1 American Clay Working Machinery Co. Eagle double die steam repress.
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2 Penfield single die steam represses.
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All in thorough repair.

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FOR SALE—CHEAP—1200 Steel Crimped Pallets. 10x34 inches. Address

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ATLAS CAR & MFG. CO.,
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FOR SALE.

Four-Mold Dry Press, absolutely as good as new. made only one kiln of brick. Can sell for less than half original price. Address

"DEALER," care Clay Record.

FOR SALE.

One E. M. Freese & Co. stiff mud Union Brick Machine, with pug mill combined. Special size.
One E. M. Freese & Co. rotating automatic cutter.
Two Stevenson nine-foot iron dry pans.

THE EGGERS BRICK CO.,
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FOR SALE.

One 16 foot Double Geared Pug Mill, one Automatic Cutting Table, and one Brick Machine, capacity 50,000 standard brick per day of 24 hours. Also 250 double deck all iron Brick Cars. For further information, address

THE DIAMOND PORTLAND CEMENT CO.
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FOR SALE.

One Conical Smooth Roll Crusher No. 25, Style "F," manufactured by American Clay Machinery Co., Bucyrus, O. One No. 5 board delivery side-cut Brick Table. This table has never been used. For information, write

STRAIGHT BROS.
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Do Your Brick Turn White?

HERE IS THE REMEDY.

PRECIPITATED

Carbonate K.B. C.F.H. **of Barytes**

The only preventative for scum and discoloration on facing Brick and Terra Cotta; neutralizing the Sulphate of Lime in the Clay and Water.

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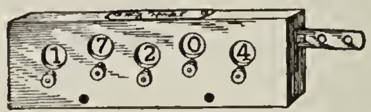

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FOR SALE—KILN PLANS.

"We have *shattered* our previous records. Time of drying 21 hours; time of burning 12 hours."

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Drain Tile and Brick Plant for sale. Good machinery. Good location. Plenty of clay. Price $2300, small payment down, long time on rest. Wil take product as pay. Address

CONTINENTAL,
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One No. 4 Double Mold Brick Repress, made by The American Clay Working Machinery Co. Price $125.00.

REPRESS, care Clay Record,
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A 4-Mold Dry Press Brick Machine and a complete wire cut brick outfit. Also Boilers and Engines of all sizes, at a bargain.

MERTES MACHINERY CO.,
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$25 **FOR SALE.** Enquire about our combination offer. Patent Brick and Tile Kiln and Patent Grateless Furnace. 40 per cent fuel saving. Next best thing to continuous kiln.

PLATT PATENT KILN CO.,
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FOR SALE.

Three 72 Chamber Presses, with rubber gaskets and sacks
One Vertical Double Belt Clay Pump.
Two Steam Clay Pumps.
Two Clay Washers.
All the above machinery used only a short time, and is as good as new. Address

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FOR SALE.

One Four-Mold Dry Press, in excellent condition. Discarded only because of a change to the stiff mud process Two new sets of Lines, ⅝ inch thick and reversible. They can be resurfaced many times. One new set top and bottom Plungers. These go with the press.

One Clay Steamer, that in a thorough test has really steamed clay. This is a thing that many will not do.

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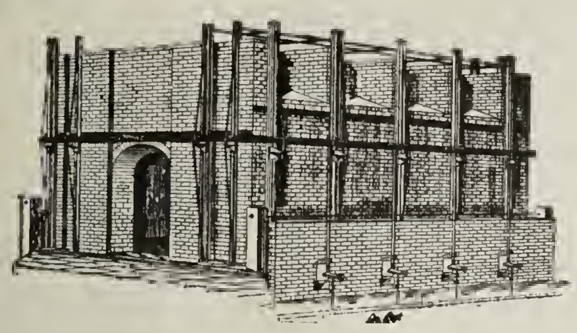

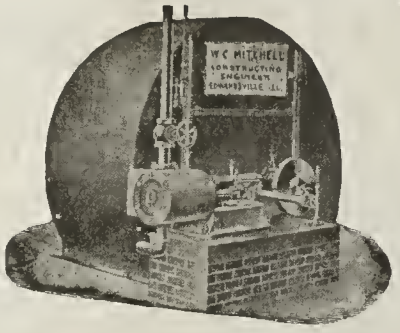

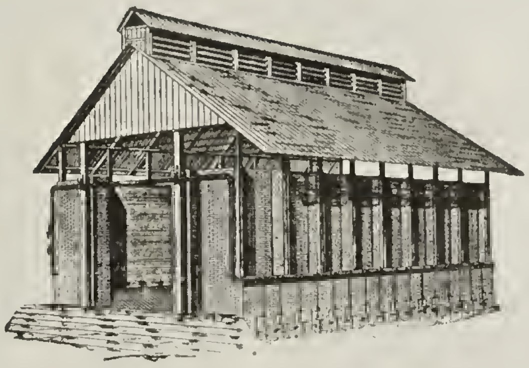

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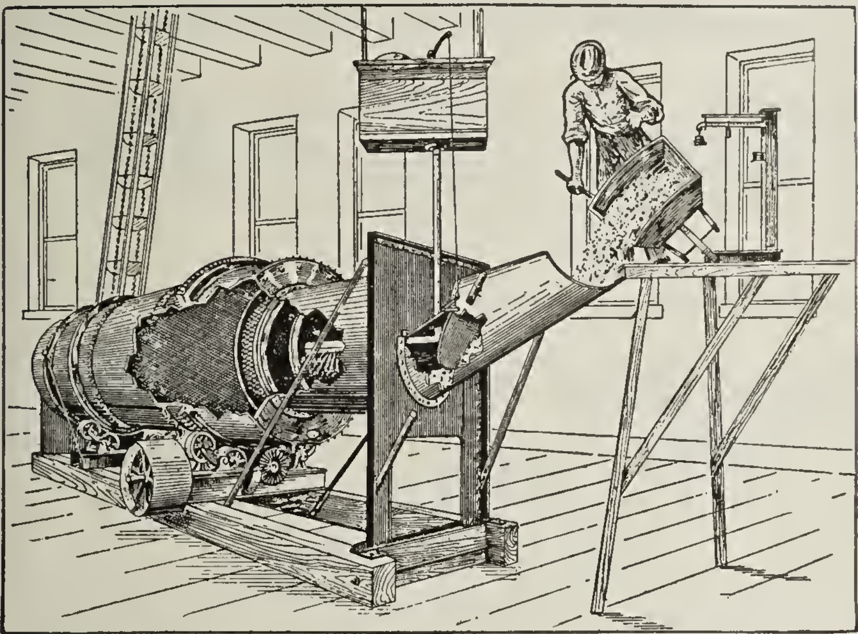
Consulting Engineer of Clay Plants, EDWARDSVILLE, ILL.



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By the Cheapest and Best Process in Existence.

AUTOMATIC FROM BEGINNING TO END.

The only requisite being the weighing of each wheelbarrow of lime before dumping it into the machine.

The HYDRATOR, as the machine is called, will do the rest.

No grinding, no separating. no free lime.

The lime as it comes from the kilns is fed the machine, the powdered hydrate—freed from all impurities, flows from the discharge end

The process is continuous.

The capacity from one to ten tons per hour, depending upon size of machine.

Especially adapted to sand-lime brick manufacture.

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Special attention given to the preparation of Clay Products from the raw material.

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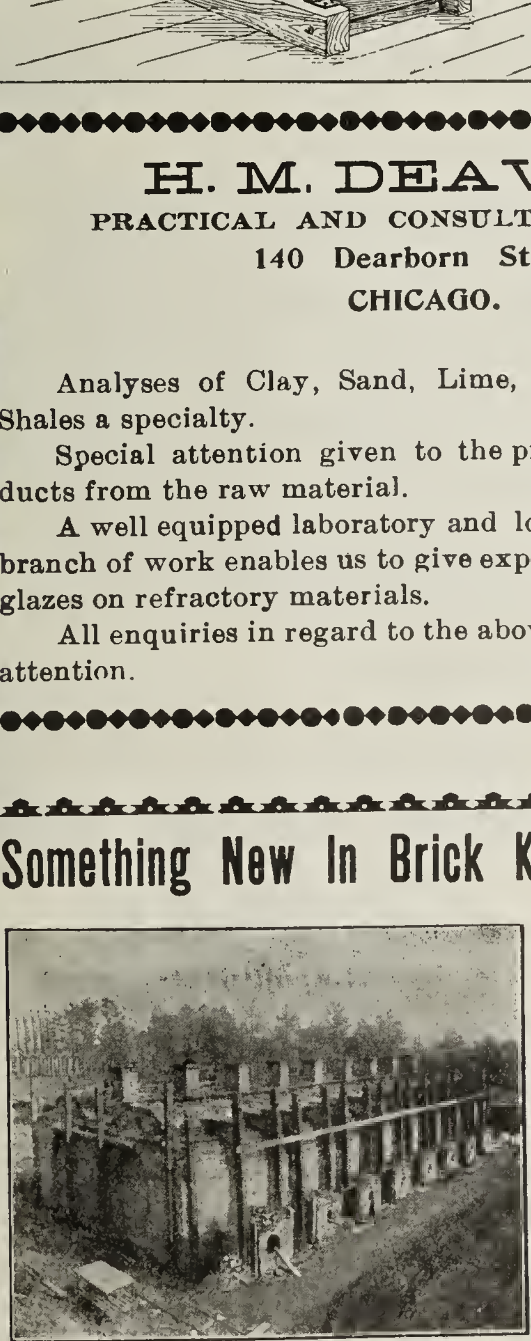
All enquiries in regard to the above will receive prompt attention.

Something New In Brick Kilns and Dryers



The Dennis Double Chamber Up and Down Draft Brick Kilns and Direct Heat and Hot Air Brick Dryers show many new features that make them superior to all others. Economical, durable and strong in construction and operation, having many points of advantage that appeal to practical brickmakers. Patented April 14, 1903 and September 8, 1903. Brick plants installed and put in operation. Write for booklet. Correspondence solicited.

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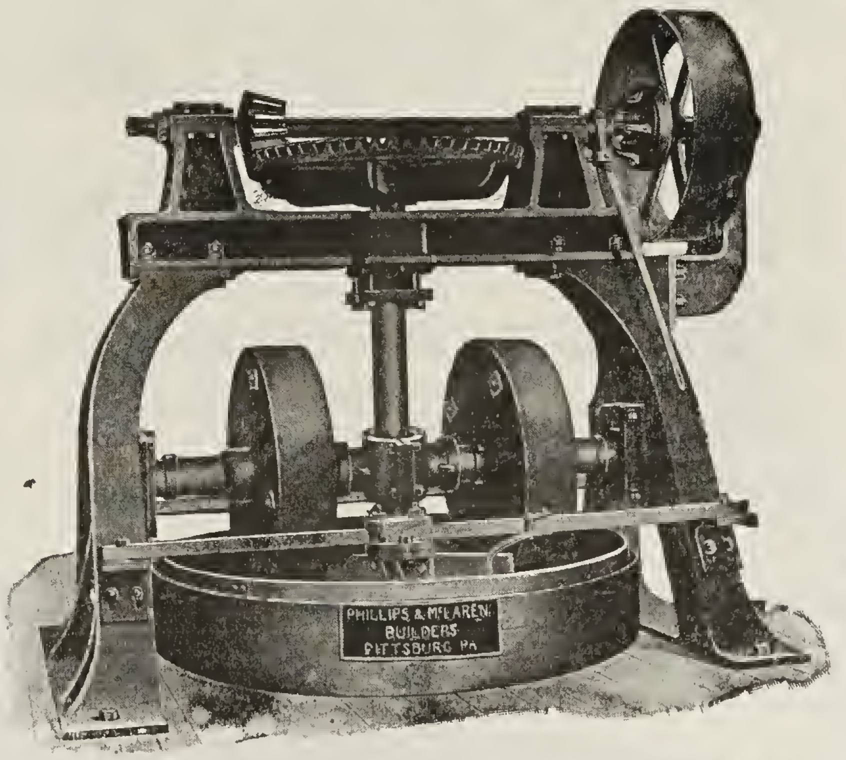

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Tell us kind of material and capacity you have and we will quote you accordingly.
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We have designed, built and reconstructed twenty-two Cement Plants in the past twenty years.

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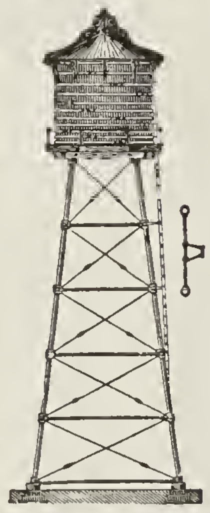

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Is a source of annoyance and danger. It is liable to rot and collapse at any time. A

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is safe, staunch and durable and will carry four times the weight of the filled tank. Expensive labor is not necessary to erect these outfits, your own men can do it. We furnigh all plans.

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How to Use Portland Cement.

From the German of L. Golinelli.
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A booklet of 30 pages, 5½x6½ inches.

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Brick Moulds and Brick Barrows

With Moulds and Barrows it is not the first cost, but it is, will they last? We have made them for over 30 years and know your wants. All kinds and shapes. A trial order will convince.

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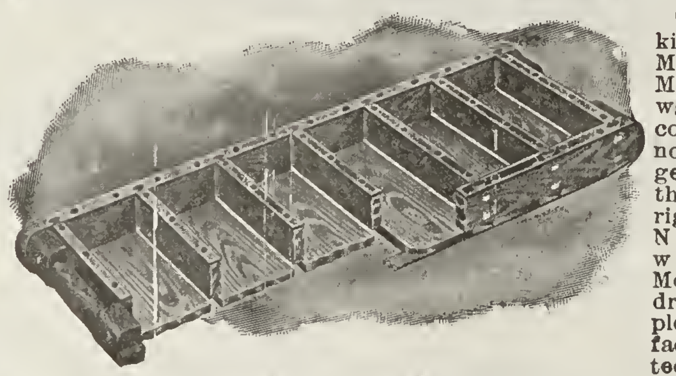

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Manufacturers of Brick Machinery and Supplies of all Kinds. **NEW LONDON, OHIO.**

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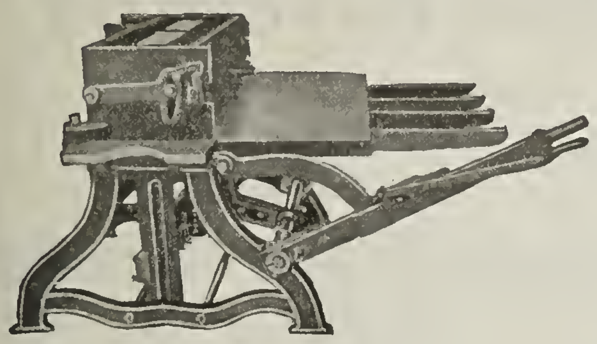

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Get equipped with a Normandin and don't be handicapped, as this machine is complete and practical. Hundreds in use, thousands of Normandin Blocks used daily. Cheaper and better than brick or stone. The U. S. Government engineers, and the leading engineers, contractors, builders, cement workers and railroads have adopted and are useing the Normandin because it's right and superior to all others. **Investigate.** Normandin Blocks are in demand. Their manufacture is a permanent and profitable business.

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When You Can Buy Ready Made Cheaper?

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The best quality of clay shale is available, natural gas for fuel can be had at very low cost, and the great markets for finished product in the rapidly growing Southwest are near at hand.

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Cincinnati, Toledo and Detroit
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3 DAILY TRAINS each way. 3

Parlor Cars. Sleepers. Dining Cars.

Your patronage is solicited. Ask for tickets via

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The Lehigh Valley Railroad Co. is about to open a new territory in the Raritan district of the New Jersey Clay Belt. Very desirable locations are offered to manufacturers.

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of the West and Northwest, and affords the best means of transportation to the markets of the world.

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A fine brick plant, in good section, in city of 50,000 people, can be bought at a bargain. Plant is practically new. Present owners are not brick men. This is a good opening for man with capital or for a company headed by good brick manufacturer. Information to parties interested.

There are other fine opportunities for brick, tile, pottery and all clay-working plants in territory of the

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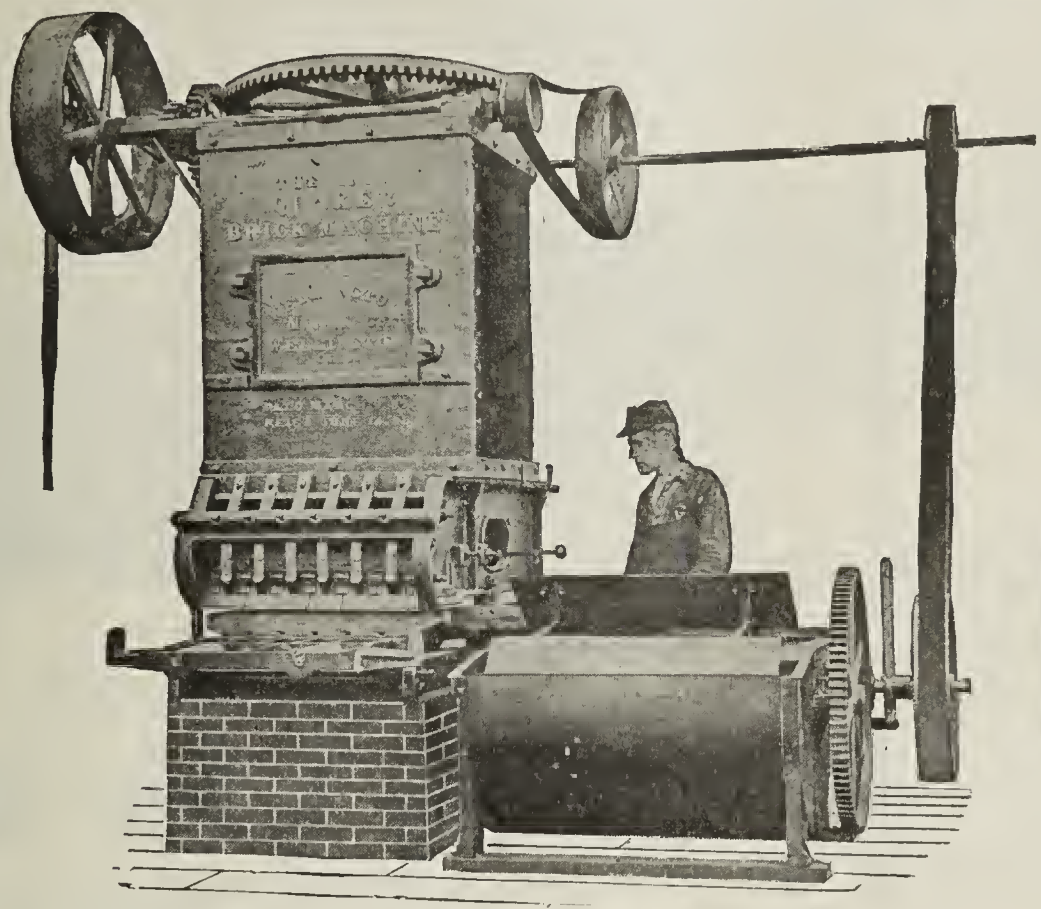
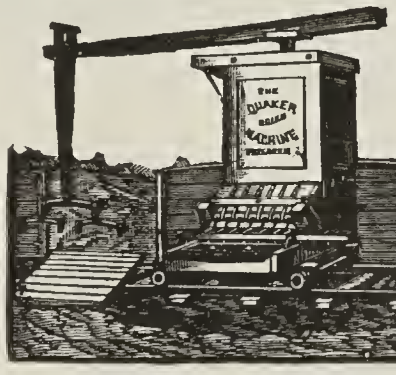


Over 500 "Quakers" in use, both Horse and Steam Power, now made entirely of Iron and Steel. I have the best, simplest and cheapest Mould Sanding Machine on the market. With my Roller-Bearing Brick Barrows you can wheel 15 per cent. more brick and do it as easily. Order one subject to approval.

ALL OTHER SUPPLIES.

Send for Catalogue.

The BEST for the least money.



CAPACITY 15,000 TO 18,000 PER DAY.

The **NEW IRON HORSE-POWER QUAKER** is indeed a model machine; it is the best machine for equipping small yards at a moderate expense that has ever been put upon the market. It is built for the attachment of steam gearing whenever desired.

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JEFFREY "CENTURY"

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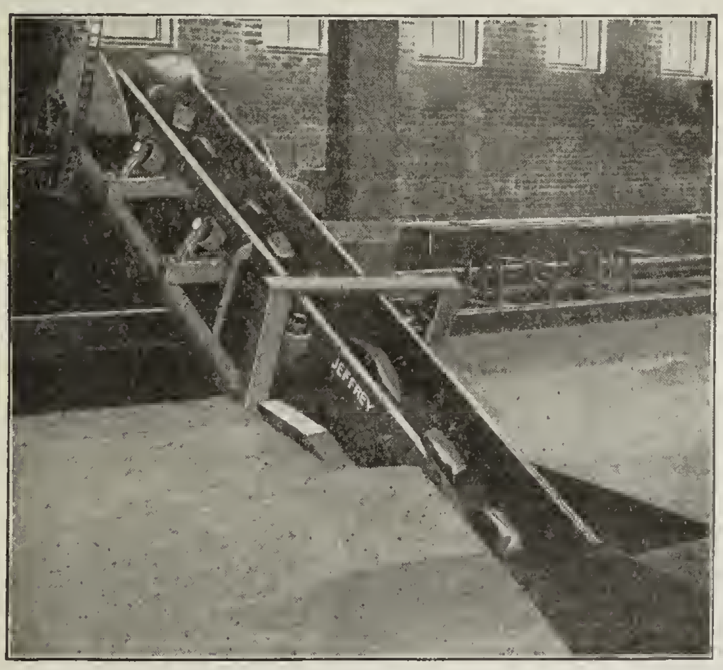

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Add a Stone Factory to Your Brick Plant?

Change Your Idle Days from a Loss to a Profit.

OUR PORTABLE HOLLOW CONCRETE BUILDING BLOCK MACHINE

Is the BEST, FASTEST, SIMPLEST and CHEAPEST on the market.

1 Man Can Make 200 Blocks Per Day

No carrying off blocks, consequently no loss by breakage, no expensive iron pallets, no cogs, gears, springs or levers, but it does the business.

WRITE FOR CATALOGUE.

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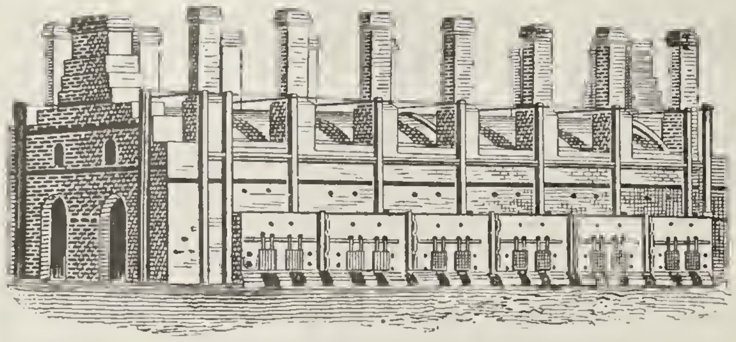
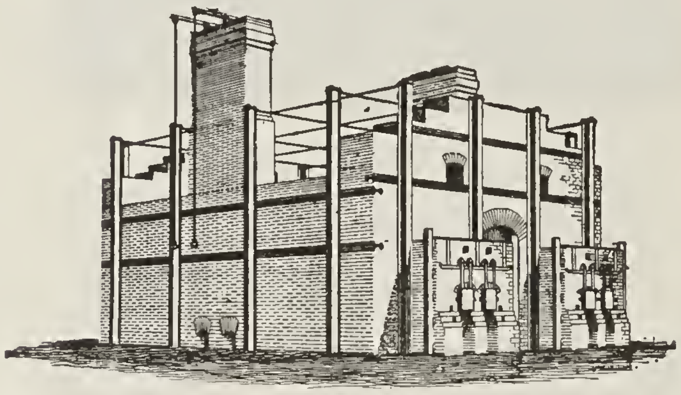


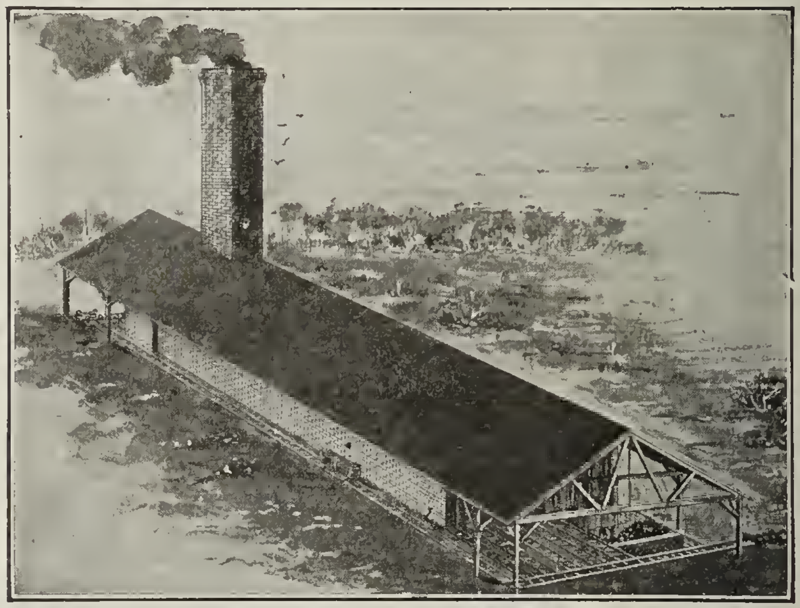
Improved Kilns, Square, Round and Continuous, End or Side Fire, Hot Air and Steam Tunnel Dryers, Steam or Hot Air Dry Floors, Test Kilns any Size.

REPRESENTATIVES WANTED.



Build the best; it is the cheapest in the end.

Hot Air or Waste Heat Dryer.



Brickmakers' Engineers.

Designers and Builders of Brick Plants.

Wilson Kiln & Dryer Co.

THOS. M. WILSON, Manager.

503 Market Street, PITTSBURG, PA.

SEND FOR CATALOGUE.

Locations for Industries

Erie Railroad
Chicago to New York

The Erie Railroad Company's Industrial Department has all the territory traversed by the railroad districted in relation to resources, adaptability, markets and advantages for manufacturing, and can advise with manufacturers in relation to the most suitable locations. The information furnished a manufacturer is reliable and has practical bearing on the nature of his particular industry.

Vast deposits of anthracite and bituminous coal, oil, natural gas—fuel is the paramount factor in manufacturing—sewer pipe, fire and other clays, cement material, gypsum, building stone and numerous other resources exist on the line.

It is important in this age of modern facilities for manufacturers to locate where they can obtain side tracks so as to receive from and ship directly into cars at the factory. Information can be promptly furnished in this connection about every point on the system between New York and Chicago.

The undersigned will be pleased to furnish full information to manufacturers and local parties contemplating the establishment of new industries.

Address, **LUIS JACKSON**
Industrial Commissioner
Erie Railroad Company
21 Cortlandt Street, New York

CLAY RECORD
is the only semi-monthly.
Subscription $1.00 Per Year.
RESULTS GUARANTEED.

MANGANESE
FOR ALL USES.
LUMP, GRAIN AND GROUND
60-70% 70-80% 80-90% OXIDE.
CLAY WORKERS' GOODS A SPECIALTY.
SAMPLES AND PRICES ON INQUIRY.
KENDALL & FLICK
WASHINGTON, D.C.

PATENTS

promptly obtained OR NO FEE. Trade-Marks, Caveats, Copyrights and Labels registered. TWENTY YEARS' PRACTICE. Highest references. Send model, sketch or photo. for free report on patentability. All business confidential. HAND-BOOK FREE. Explains everything. Tells How to Obtain and Sell Patents, What Inventions Will Pay, How to Get a Partner, explains best mechanical movements, and contains 300 other subjects of importance to inventors. *Address,*

H. B. WILLSON & CO. Patent Attorneys
Box 241 Willson Bldg. WASHINGTON, D. C.

Clay, Cement, Brick
AND
OTHER INDUSTRIES
ARE
OFFERED LOCATIONS
WITH
Satisfactory Inducements,
Favorable Freight Rates,
Good Labor Conditions,
Healthful Communities,
ON THE LINES OF
THE ILLINOIS CENTRAL R. R.
AND THE
YAZOO & MISSISSIPPI VALLEY R. R.

For full information and descriptive pamphlet address

J. C. CLAIR,
Industrial Commissioner,
1 Park Row, Chicago, Ill.

SAND=LIME BRICK

THE BEST MONEY-MAKER IN THIS COUNTRY TODAY.

Plants installed complete on the AMERICAN SYSTEM, equipped with AMERICAN MACHINERY, started and operated until 100,000 brick are made. Quality Guaranteed. No Failures. No Experimenting. No Royalties. No Secrets. No Chemicals.

Send for Free Booklet.

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SAN FRANCISCO OFFICE: 501 Rialto Bldg.
SOUTHERN OFFICE: City Bank & Trust Co. Bldg.,
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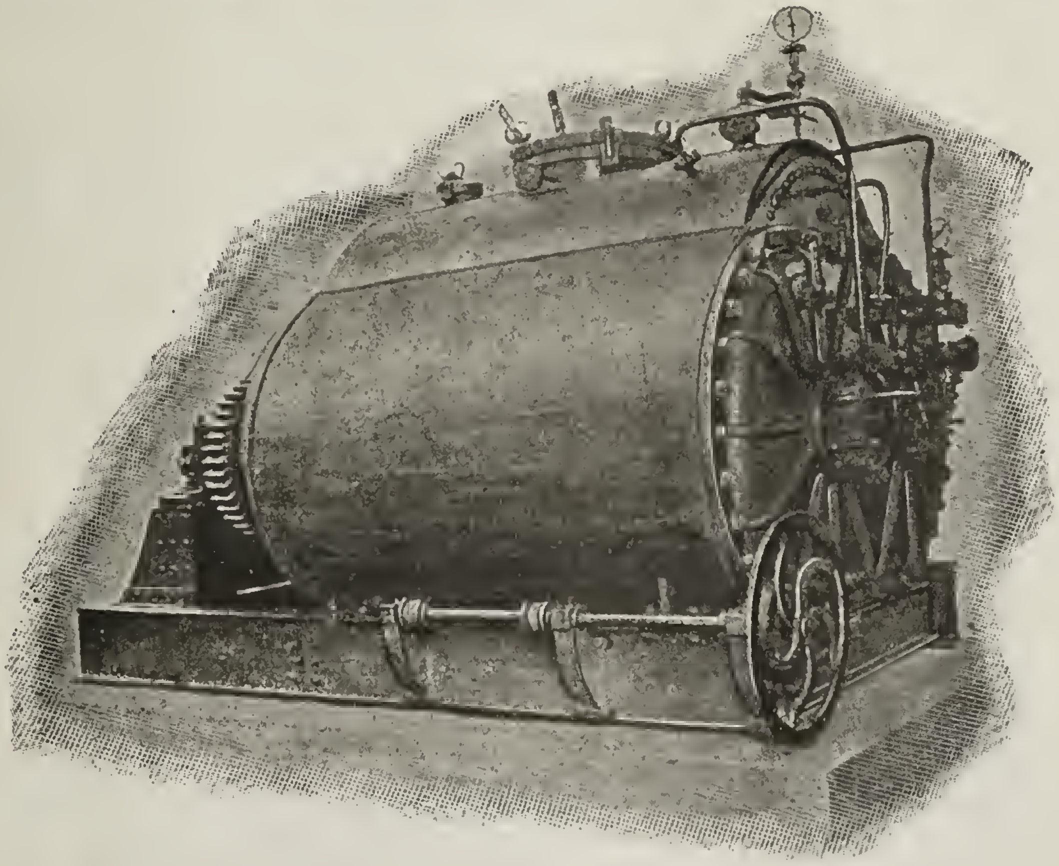
American Sand-Lime Brick Co.
Great Northern Bldg., 77 Jackson Blvd., CHICAGO, U. S. A.

SAND-LIME BRICK



If you desire to produce the very highest quality brick possible, you must install the

"Scientific System"

Schwarz System Brick Company

8-10 Bridge St., New York City

San Francisco Office:
320 CROSSLEY BUILDING

TALLEST SAND-LIME BRICK BUILDING IN THE U. S.
BRICK MADE ON OUR SAMSON PRESSES.

SEMISTEEL CO.

ENGINEERS AND FOUNDERS

701 New England Building
CLEVELAND, OHIO

Sand-Lime Brick

Plants Erected of any Capacity

Have you any Sand?

If so, you need what we have.

Our System is used by the first Sand-Lime Brick Plant in the United States, and has been in continuous operation and has produced and sold more brick than any other single plant.

Send for information. We have equipped plants in all parts of the United States. We do not use cement or chemicals, and do not sell patent rights.

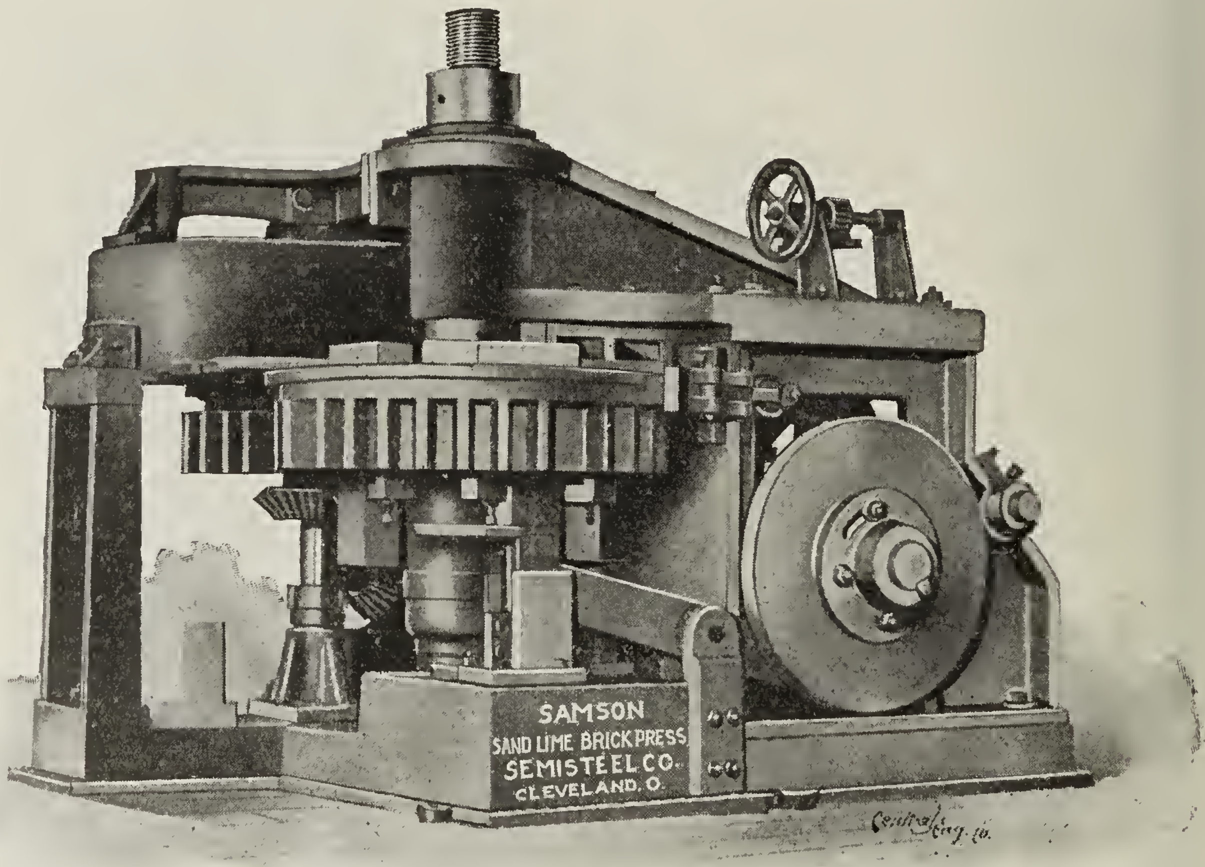
SEND FOR FREE BOOK.

We are not brokers, but operate our own foundry and machine shop.

WE MANUFACTURE

Special Sand Brick Presses
Hardening Cylinders
Sand Mixers
Sand Dryers
Conveying Machinery
Brick Cars, Transfer Cars
Elevators
Steel Castings
Manganese Steel
Cast Iron, Nickel Steel

SEMISTEEL CO.
701 New England Building
CLEVELAND, - OHIO



"Huennekes System"

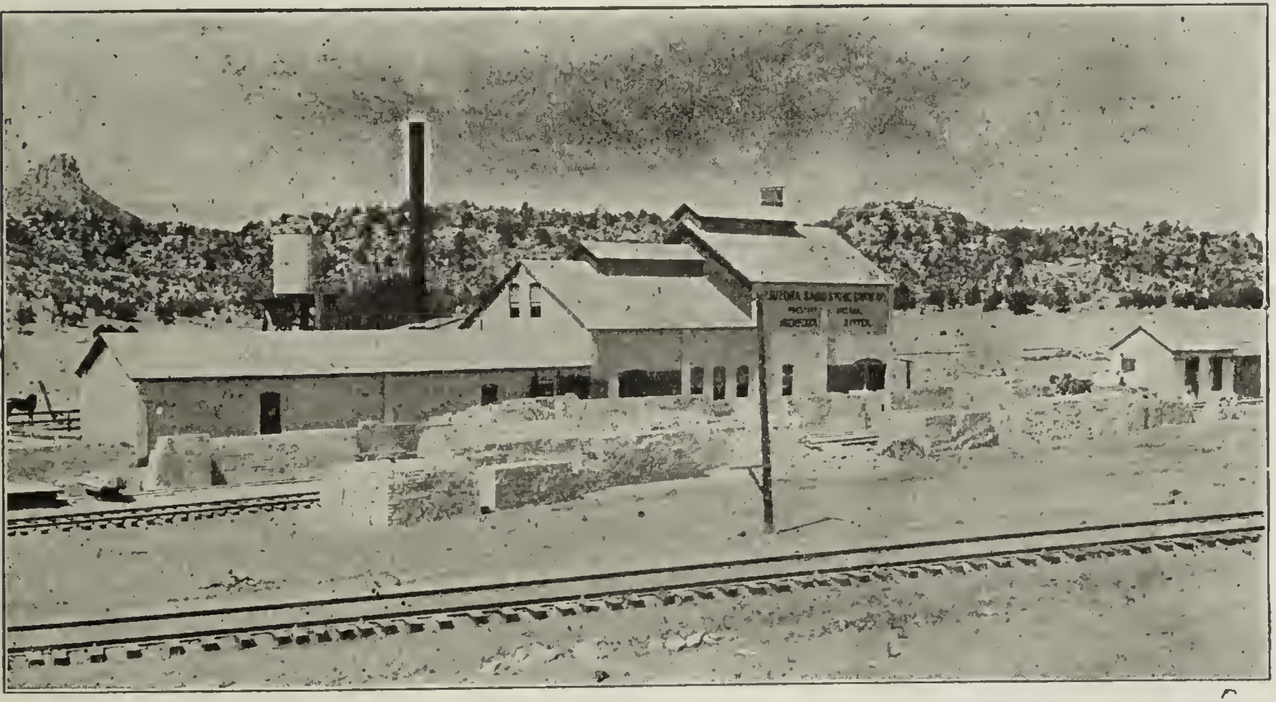
SAND-LIME BRICKS AND BLOCKS

25 Factories Designed, Equipped and Set in Operation During the Past Year in the United States and Canada.

OUR RECORD: Combined capacity of factories in 1903, 15 million bricks per annum.
Combined capacity of factories in 1904, 150 million bricks per annum.

Received from the Jury of Awards at the Louisiana Purchase Exposition the highest award for excellence of sand-lime brick.

U. S. Company's Quarters, Whipple Barracks, Prescott, Arizona, Erected Out of "Huennekes System" Sand-Lime Bricks



Factory of the Arizona Sand-Stone Brick Company, "Huennekes System" Prescott, Arizona. Finished in Bricks of Their Own Manufacture.

"THINK THIS OVER."

Before the expiration of this year the total combined capacity of the factories erected and operated under the "Huennekes System" will be about 300 million bricks per annum—or a growth of about 2,000 per cent in one year.

Remember the doubts and scoffings about the "dry pressed brick" but a few years ago and the money made by the pioneers in this business.

The Sand-Lime Brick Business is to day in the identical state as the dry pressed brick business was but a few years ago.

All of our special machinery is manufactured in the United States by the foremost machine shops in their particular line of business, and are thoroughly tested, insured and guaranteed before leaving shops. All special machinery, as well as our methods and process are fully protected and covered by United States Patents. **Without the use of the same it has proved impossible to produce a high grade brick out of sand and lime in a commercial way at a low cost. The rapid growth of our business from 15 million brick per annum in 1903 to 150 million brick per annum in 1904** is not only a proof of the merits of the "Huennekes System," but also of the product itself.

Send for free booklet, tests and testimonials.

The original, oldest and only experienced **Engineering Firm** in the Sand-Lime Brick Industry.

H. HUENNEKES COMPANY

Engineers and Contractors for the
Erection of Sand-Lime Brick Factories.

MAIN OFFICES
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Western Office: 660 Monadnock Building, CHICAGO, ILL.

SHALE FIRE CLAY

OUR SUBJECT MACHINERY

Covers a line of **PRESSES** and **PANS** for making

SEWER PIPE FIRE PROOFING DRAIN TILE

Also Tuyeres, Sleeves, Nozzles, Runner Brick for Bessemer Steel process.

Write for prices stating your requirements.

THE TURNER, VAUGHN & TAYLOR CO.
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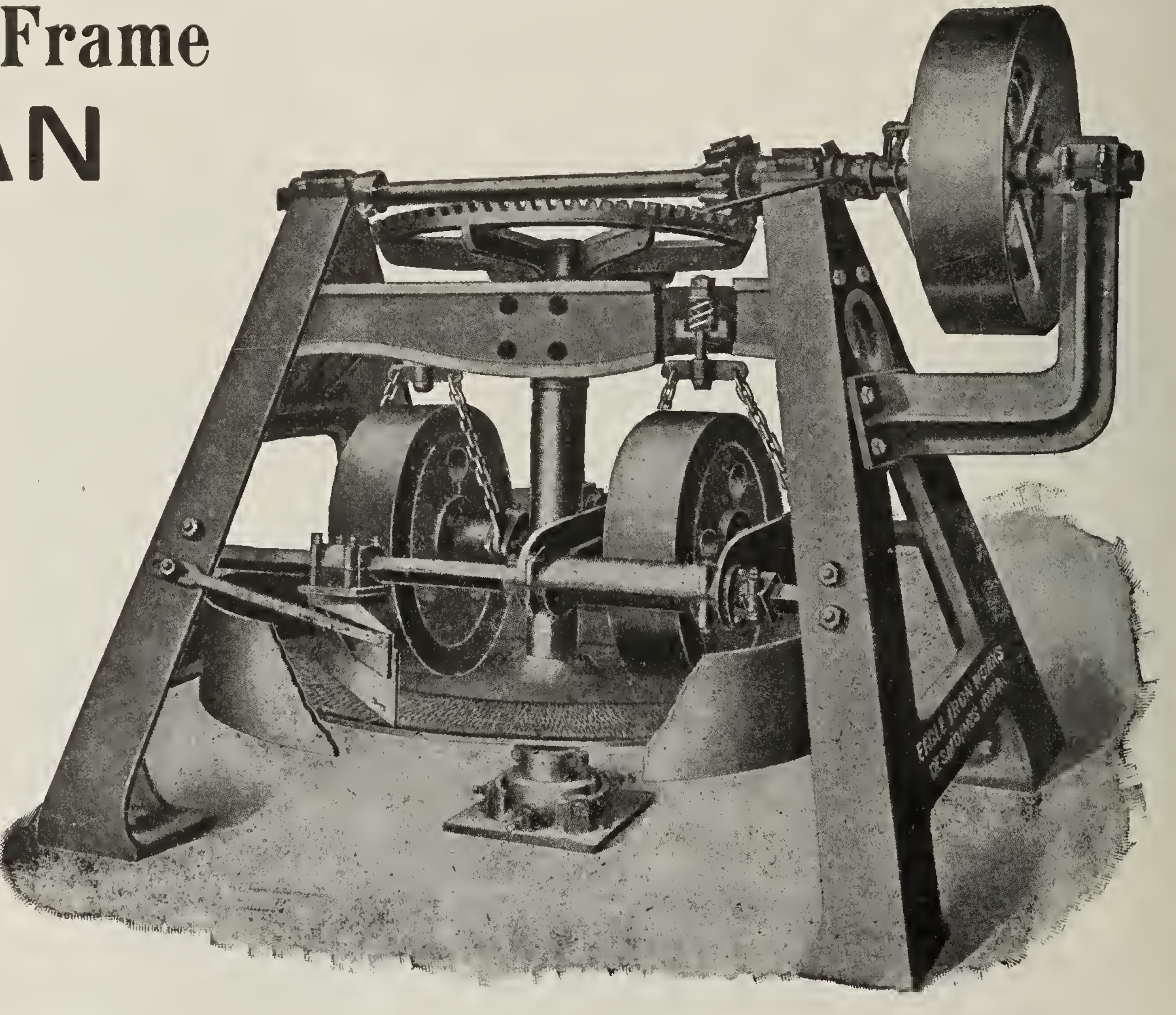
Nine Foot Iron Frame DRY PAN

With Independent and Suspended

MULLERS

A well-tried and proven Success.



EAGLE IRON WORKS, BUILDERS, DES MOINES, IOWA

ORDERS FOR PERFECT CLAY SCREEN

are proving our claims, as our record of sales for one week are fifteen screens. Thirteen of these were for old customers while two were for new ones. If our old customers were so well pleased, why can we not do as much for you?

If you use a screen we claim we can save you money by using ours.

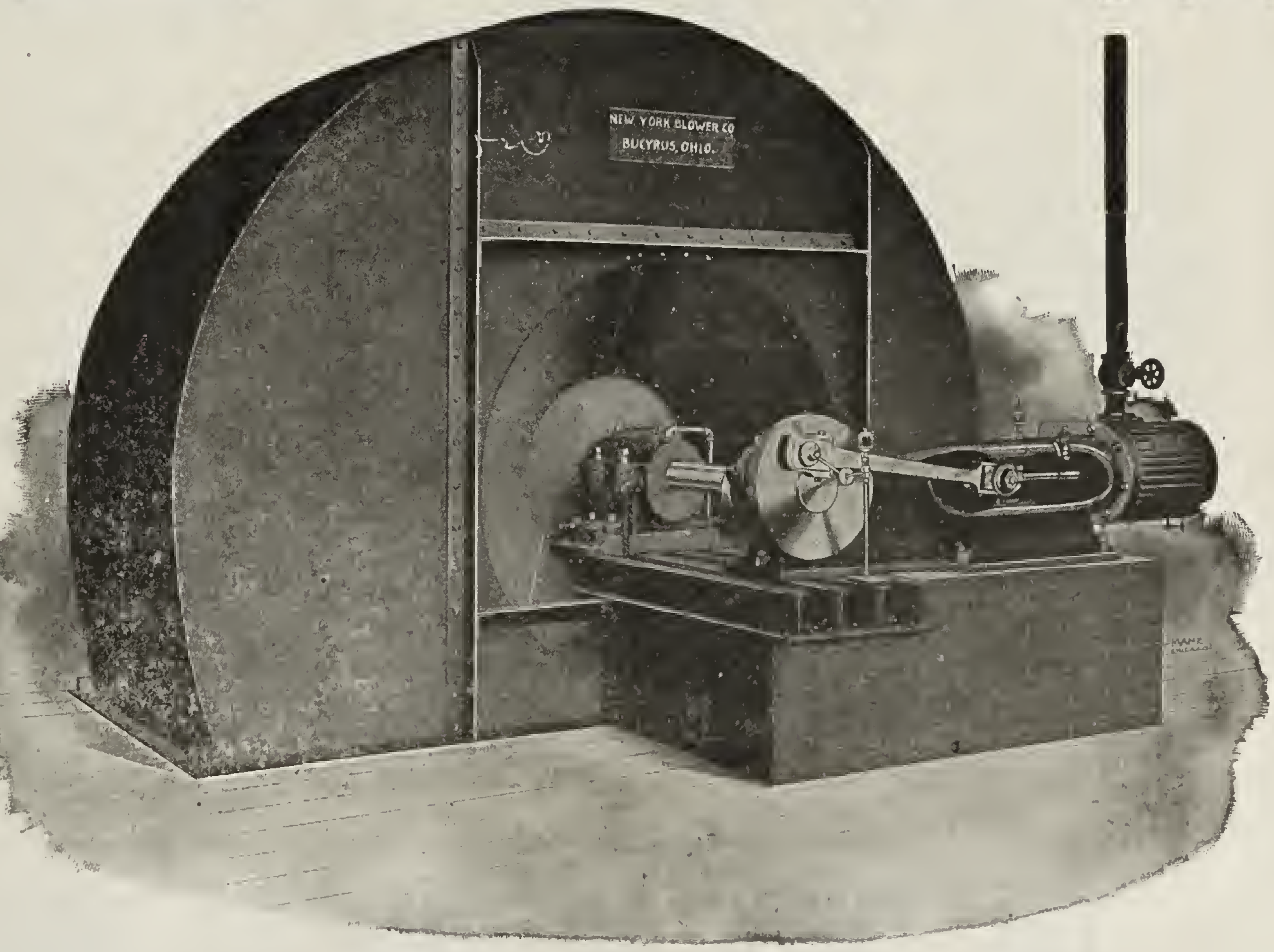
DOES NOT THIS RECORD OF SALES PROVE OUR CLAIM.

We guarantee satisfaction, let us show you what we can do. Our new catalog for the asking.

DUNLAP MFG. CO.,
BLOOMINGTON, ILL.

WASTE HEAT CLAY DRYER.

We offer the New York Blower Company's Improved Waste Heat Dryer as the most successful means of utilizing the heat from the cooling kilns which is at present an absolute waste. The two important factors in drying are heat and circulation of air; one being as important as the other. These are both amply provided for in our dryer. By the use of mixing chamber, provided with the proper dampers fresh air can be admitted to the fan to reduce the temperature of the incoming gases to the proper degree. By changing the speed of the fan the amount of air blown into the tunnels is easily regulated. With this apparatus, by which you can readily regulate and control the heat and circulation, you have a dryer which will work successfully in all climates and temperatures The necessity of perfect circulation in a dryer should never be overlooked. With this end in view we provide additional circulating devices in our largest dryers. This maintains an even and positive circulation throughout the dryer and insures the successful drying of your brick.



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EUROPEAN OFFICE:
Cathedral Corner, Fennel Street,
MANCHESTER, ENGLAND

NEW YORK BLOWER CO.
BUCYRUS, OHIO.

A RHYME OF REASON.

Rodgers knows a thing or two
Of importance—yes to you.
Don't delay; investigate;
Get in line before too late.
Economy in drying brick—
Rodgers shows you every trick—
Saving will result from it.

Do you ever wonder how
Rivals dry their brick and vow
You should make more money too,
Even with no more to do?
Rodgers knows—the trick is his;
Saving **Waste Heat** is his "biz."

L. E. RODGERS ENGINEERING CO.

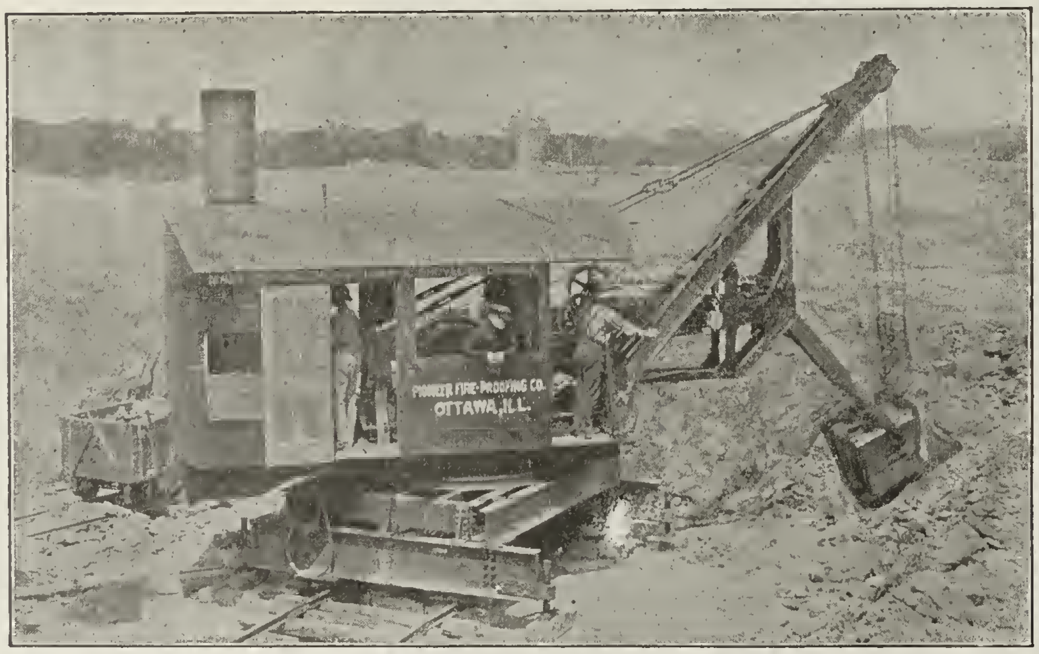
WASTE HEAT DRYER SPECIALISTS

303 Dearborn Street, *CHICAGO*

HANDLE YOUR CLAY WITH ONE MAN AND

The Thew Steam Shovels

Made In Four Sizes. Mounted on Car Wheels or Traction Wheels.



Type No. 2 Shovel—Pioneer Fireproofing Co., Ottawa, Ill.

Especially adapted for brickyard requirements. The shovel operates in a complete circle, enabling material to be delivered at side or in rear at will. The Dipper is hung from a horizontally moving carriage and can be adjusted to cut to any desired level.

: : Only One Operator Required.
Wire Cables used instead of Chains.
Strictly First-Class in Every Detail.

Economical for brickyards 30,000 to 40,000 daily capacity.

Operated by one man for outputs up to 125,000 brick per day.

Write us for Catalogues and Information.

THE THEW AUTOMATIC SHOVEL CO.,

LORAIN, OHIO.

A Perfect Clay Handling System.

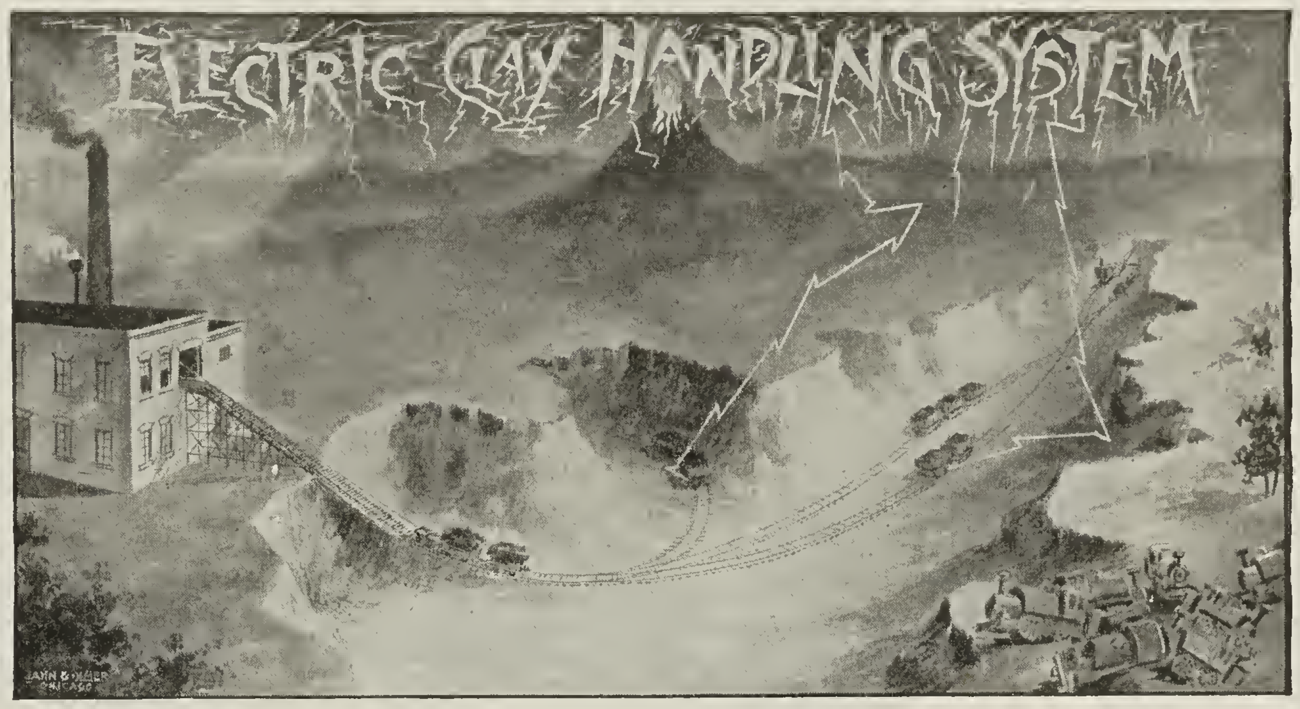
We install our system and turn it over to you under guarantee of satisfactory results.

We do not shut your plant down while installing.

Our entire system is operated and controlled by ONE man at the hoist, and no horses, locomotives, or men required between bank and machine.

Scarcely any power required.

We invite you to come and see a large plant in operation.



HAUSER COMPANY, CHICAGO

General and Electrical Contractors, Power Construction and the Design and Equipment of Modern Clay Working Plants.

Southwest to Prosperity

Get Rich in the Southwest. We know you can because thousands are already doing so. They have seized upon opportunities, and in developing the natural resources have opened the door of opportunity for others—opened it, mind you, not closed it. Don't wait for Prosperity to come to you. Go to Prosperity. Get Into partnership with the Southwest and you will have a partner that does not know what failure is. It is worth a great deal to you to be located in a prosperous, growing country that has not reached the dead level of development.

Opportunities. There are many opportunities for small manufactories, industries of various kinds, mechanics, merchants, farmers and stock-raisers. The best of them are along the new lines of the Rock Island, and our folder, Business Opportunities, will tell you all about them.

Mild Winters Southwest. Right here may be the difference between success and failure. You can work more days in every year in the Southwest than in the East and North—the land works with you. The earning capacity of the land is greater, the earning capacity of every man is greater, whether farmer, mechanic or tradesman. They're plowing in their shirt sleeves in the Southwest **to-day.** Think of that. The climate is mild and pleasant, the soil rich and markets good. Nowhere in the world is there such an opportunity for men who want to improve their condition.

How We Can Help. The Rock Island has no land to sell, but is deeply interested in inducing a desirable class of people to locate tributary to its lines. To do this we maintain a department for the purpose of giving truthful and complete information regarding every opening that exists in our vast territory. We have collected valuable data about all the districts along our lines. We will tell you where the openings are, the amount of capital needed and the price of lands.

Low Rates. To enable you to look the country over, very low Homeseekers' rates are made by the Rock Island.

Act at Once if you want the first choice. There are hundreds who will read this and decide that the Southwest is the place for them, and they will never regret it. Fill out the coupon below and mail it to the undersigned. All your questions will be promptly answered by personal letter. **Do it to-day.**

Please send me illustrated booklet about________________(name section) with full information and particulars of reduced rates to that section.

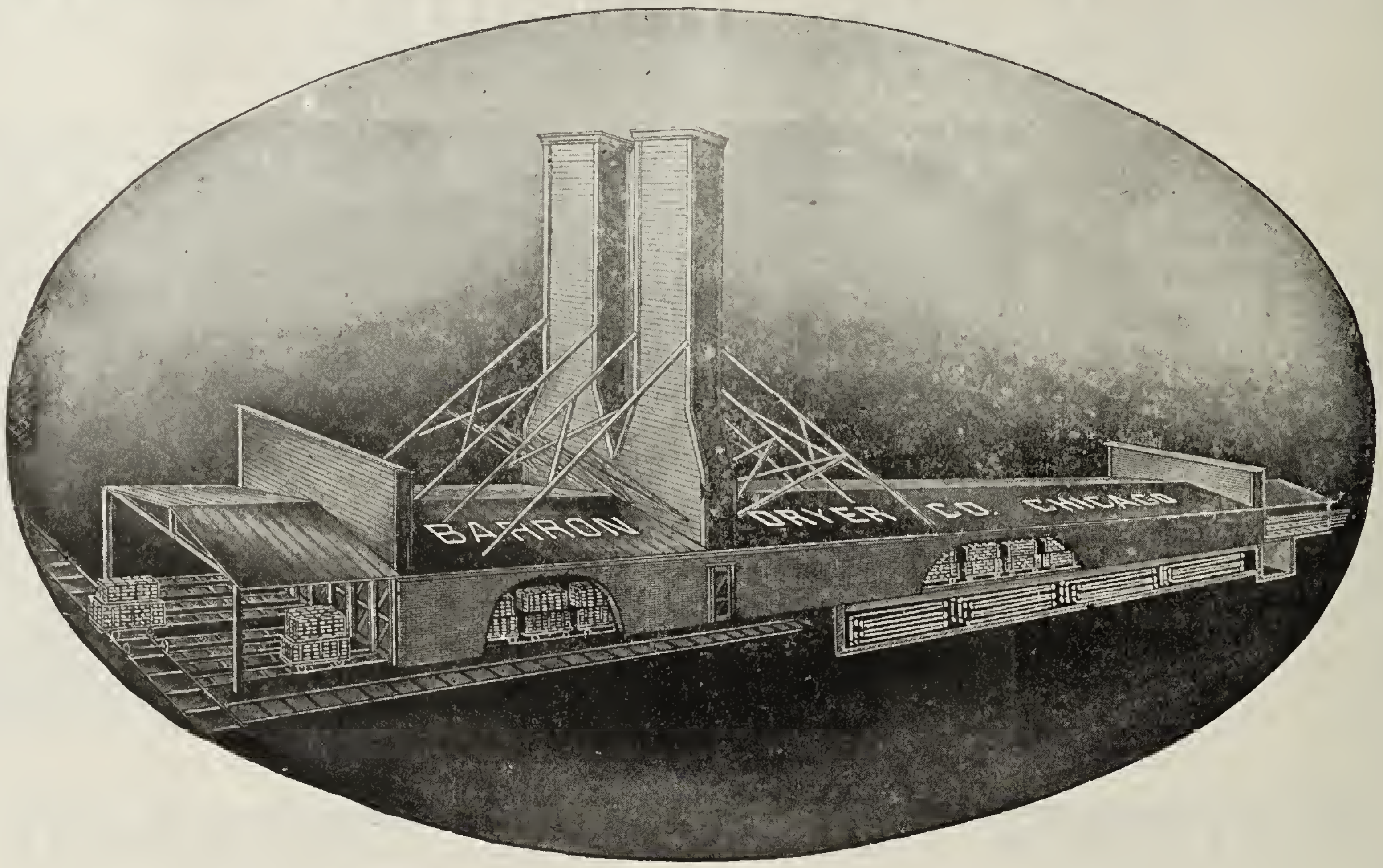
Name________________

P. O. Address________________

State________________

Rock Island System

JOHN SEBASTIAN, Passenger Traffic Manager, Rock Island System, Chicago, Ill.



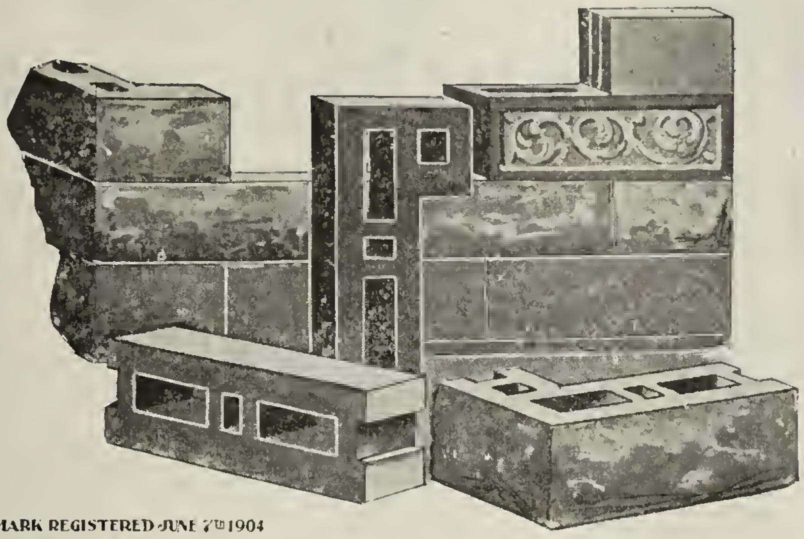
If You Are Progressive

You know that the brickmakers who are making the money in these days are those who have installed an up-to-date drying system enabling them to cope with ease with the heaviest demands of the market, their operations being uninterrupted all the year round.

This is true of them, what of your case? Why adhere still to antiquated methods subjected to weather limitations. Determine to install the most effective drying system in existence and apply for information and quotations to the

BARRON DRYER COMPANY

Temple Court Building, 225 Dearborn Street, CHICAGO, ILL.



TRADE MARK REGISTERED JUNE 7th 1904
BY HARMON S. PALMER HOLLOW CONCRETE
BUILDING BLOCK COMPANY.

PALMER'S MACHINE

IT IS THE BEST BY EVERY TEST

ALL OF
THESE POINTS
ARE COVERED
BY PATENTS
TO US AND
NO OTHERS.
FOUR PARTIES
HAVE
ALREADY BEEN
ENJOINED
BY US IN
UNITED
STATES
COURTS
FOR
INFRINGING
OUR PATENTS.

BECAUSE:

It makes all lengths from **four** to **thirty-two** inches.

It makes all widths from **four** to **eighteen** inches.

It makes all heights from **one** to **nine** inches.

It makes all angles for **bay-windows.**

It makes blocks of different contour by removable face plates with patented designs.

It makes **joist** blocks and **nelting-courses.**

It was invented by a **practical** builder who knew what was necessary.

Its proportion as to strength and weight are correct.

It is not a cumbersome and bungling piece of mechanism.

Every block necessary to complete system of construction made by Palmer's machine. No waste.

Don't be deceived into buying a machine just because it makes a hole in a block. This is like poison to our business.

Beware of charlatans and mountebanks who know nothing of the business, but want the public's money on the reputation and success of others.

Report infringing machines to Mr. Frank L. Wolfe, Two Rivers, Wis., Secretary National Organization of Cement Block Makers.

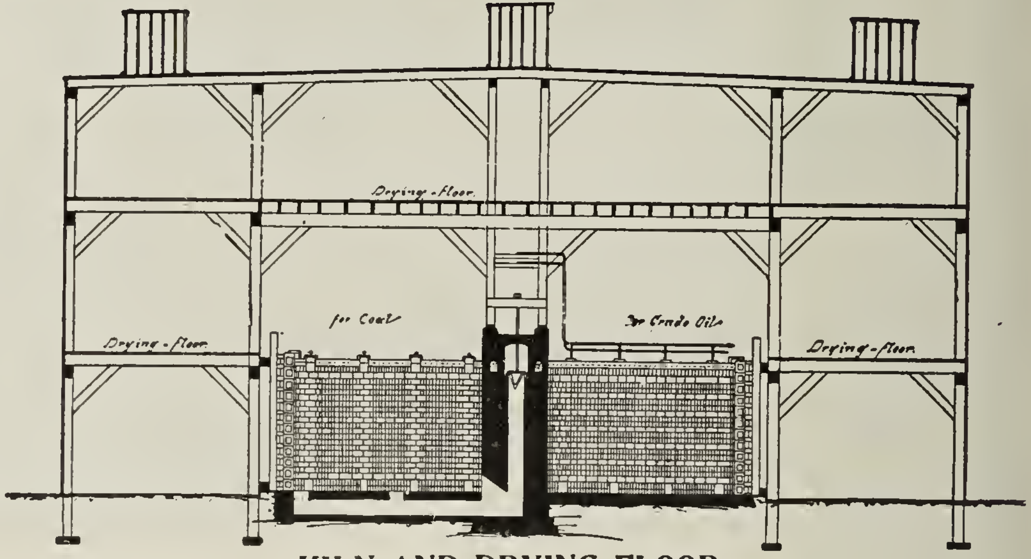
THE HARMON S. PALMER COMPANY

WASHINGTON, D. C.

Lehmann Portable Continuous Kiln in Combination with Drying Floors...

CHEAPEST AND SIMPLEST CONTINUOUS KILN ON THE MARKET

Can be constructed ready for work in six to eight weeks, and adapted to all kinds of fuel. Saves 65 to 75 per cent. on fuel as compared with up-draft or down-draft kilns. Drying is done by heat escaping from kiln without extra expense, gradually, uniformly and thoroughly. Goods are handled by automatic delivery elevators, and cost of handling, drying and burning is reduced to a minimum.



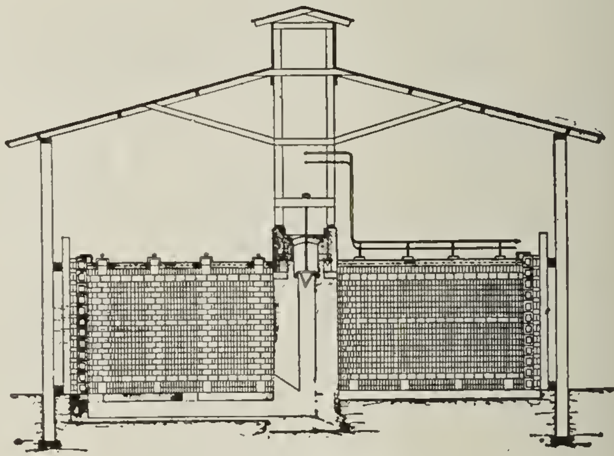
KILN AND DRYING FLOOR.

Lehmann Crude Oil Burning Apparatus

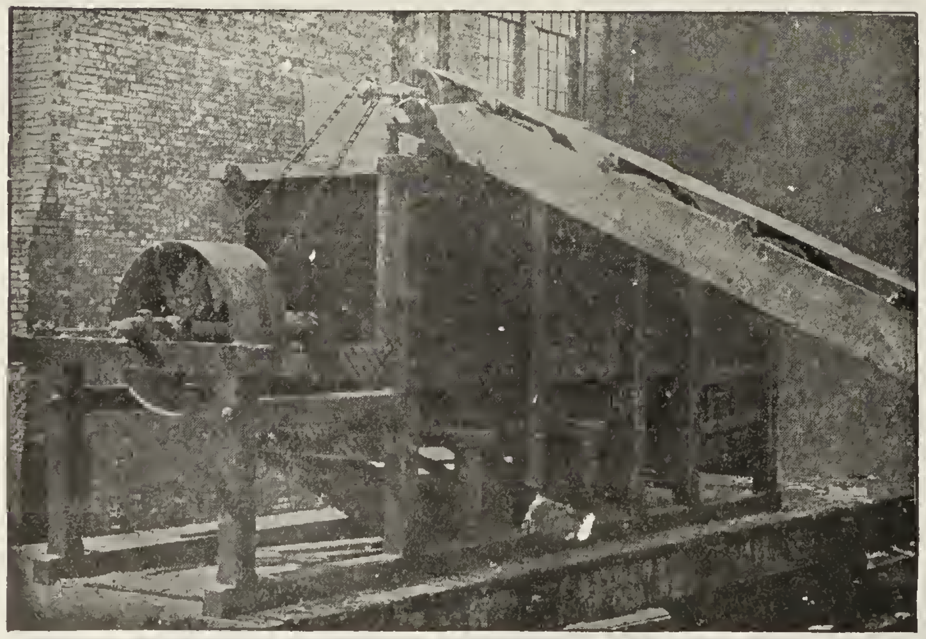
First successful attempt to burn Crude Oil in a Continuous Kiln; can be applied to any system.

Lehmann Metal Lined, Self-Lubricating Die

Can be made and adapted to any kind of clay at the place of manufacture, and insures uniformity of size of manufactured goods.



CONTINUOUS KILN



LEHMANN SLUMMING MACHINE

Lehmann Slumming Machine

MOST PRACTICAL, SIMPLE AND EFFECTIVE

The slumming process is the most economical and the only reliable method for removing gravel and other foreign matter from Common Clay, Kaolin, Chalk, Mineral Paints, etc.

ALL THESE DEVICES HAVE BEEN TRIED THOROUGHLY AND SUCCESSFULLY.

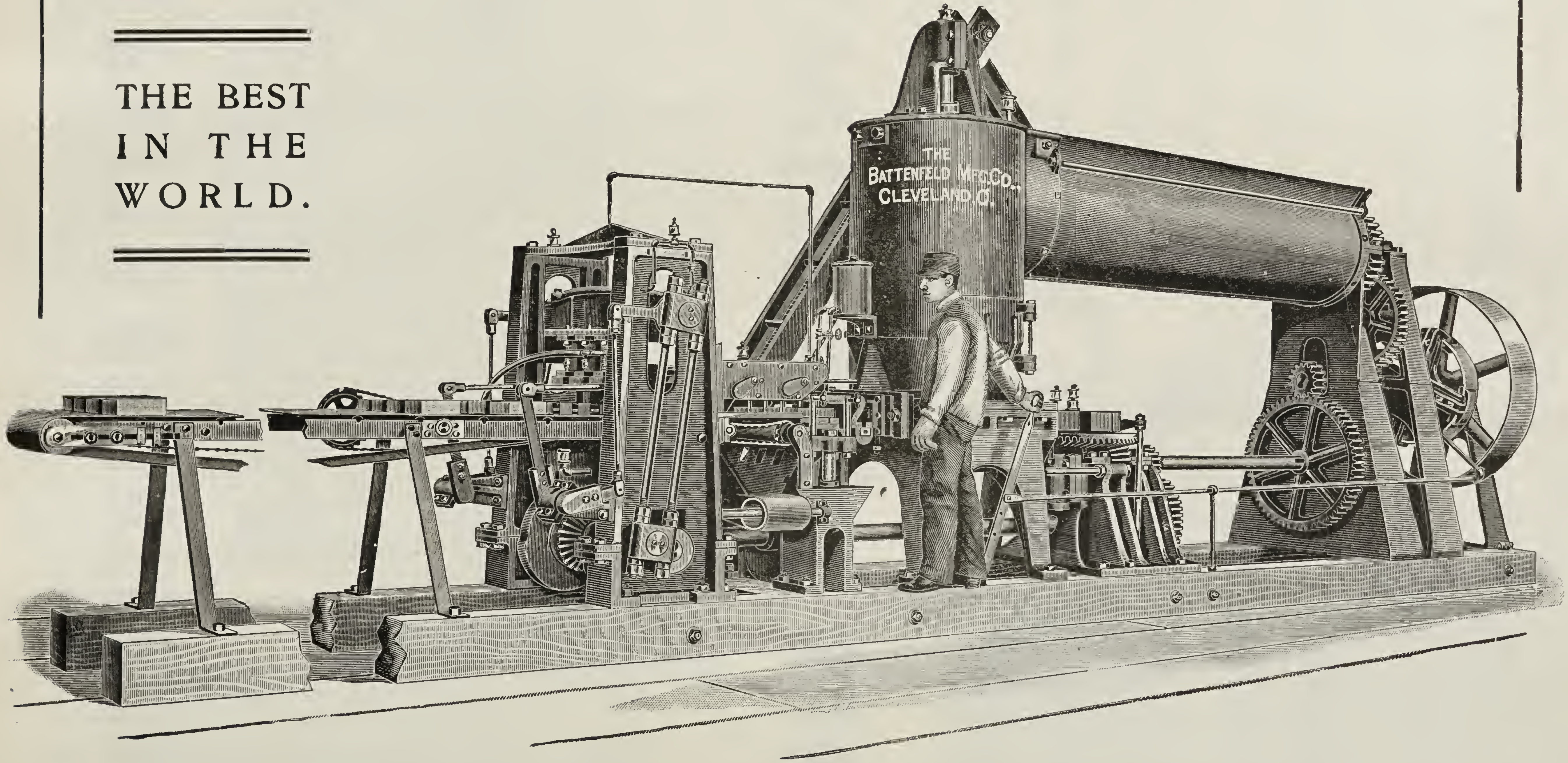
Will plan and construct any system of Kiln...Up-Draft, Down-Draft, Muffle or Tunnel. Plans and estimates furnished for Brick and Tile, Lime and Cement Work. Practical tests made.

F. LEHMANN COMPANY

Consulting Clay-Worker Engineers,
163 Rhine Street, Chicago, Ill.

THE DICTATOR BRICK MACHINE

THE BEST
IN THE
WORLD.

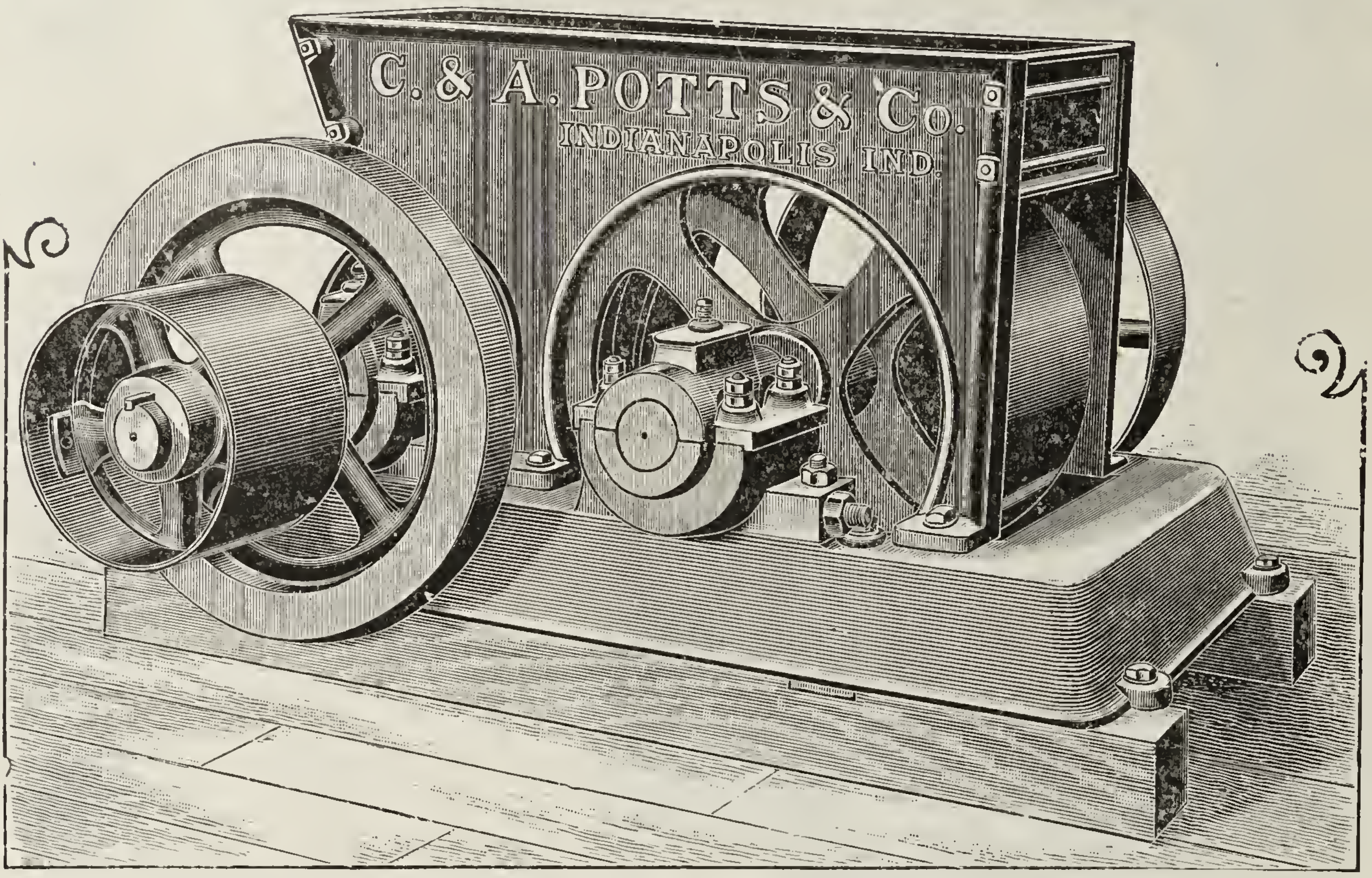

THE
BATTENFELD MFG.CO.
CLEVELAND, O.

THE BATTENFELD MFG. CO.

WRITE FOR CATALOGUE.

CLEVELAND, OHIO.

THE POTTS DISINTEGRATOR


C. & A. POTTS & Co.
INDIANAPOLIS IND.

Is not a spite machine, but is built the best possible. Having Heavy Chilled Rolls, Ring Oiling Bearings, Shafts of Steel and large in Diameter. The most successful machine for grinding out sticky clays and separating the stone.

THE POTTS MOULD SANDER

Simple in Construction,

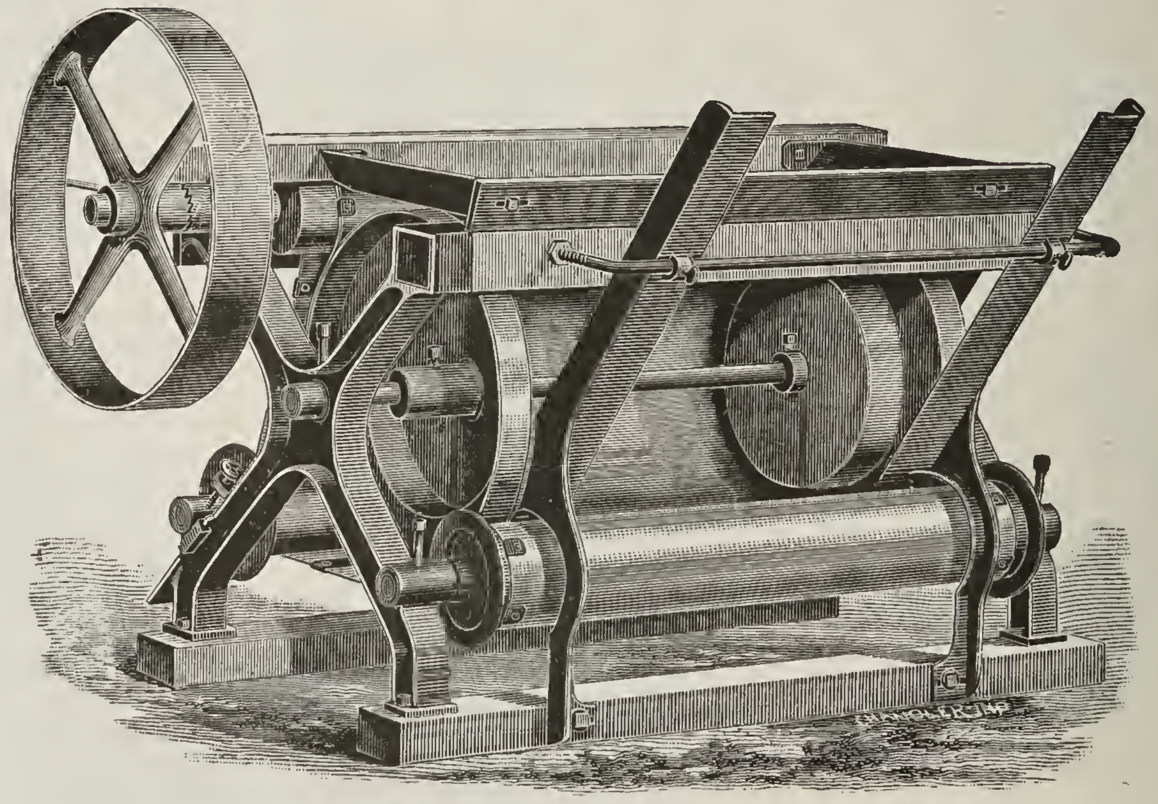
Strong and Durable,

Sands the Moulds Perfectly,

Never Strikes or gets Drunk,

Always Ready for Work,

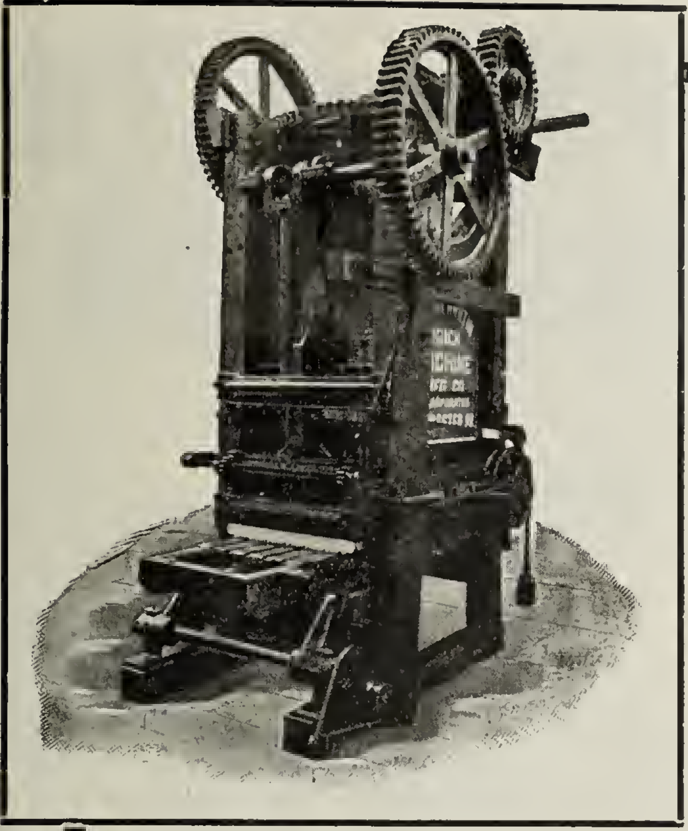
No Brick Machine Complete
without this Machine.



Patented February 5, 1889.

We make a specialty of equipping Sand Mould plants complete. We are the largest manufacturers of this class ot machinery in the world. Write for prices.

C. & A. POTTS & CO., Indianaoplis, Ind.



THERE'S A REASON

WHY

THE "MARTIN"

BRICK MAKING MACHINERY

HAS PROVEN SO SUCCESSFUL

IT'S THE WAY IT'S BUILT

Turns out square cornered brick with smooth faces, and at a capacity limited only by the facilities on the brick yard. The

MARTIN STYLE "A"

will prove a most profitable investment for any brick maker.

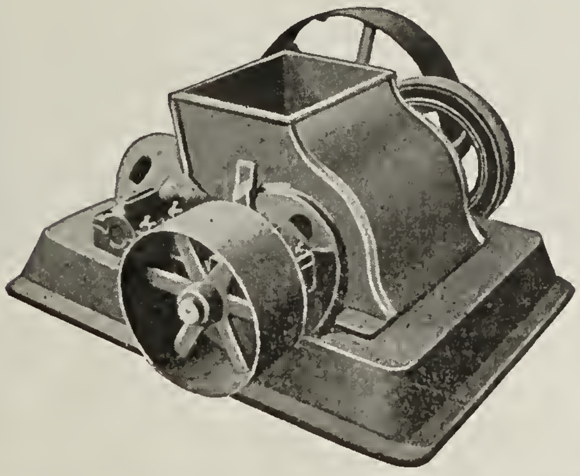
CRUSHERS——SCREENS——CONVEYORS

FOR EVERY REQUIREMENT.

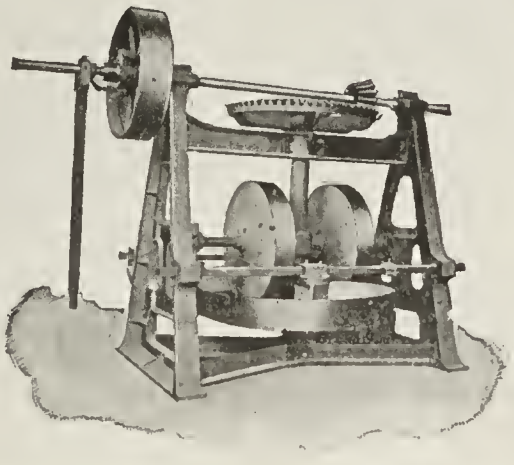
Let us send you a copy of our complete catalog No. 90A, showing our line of "Everything a Brickmaker Needs."

BRICK-YARD SUPPLIES

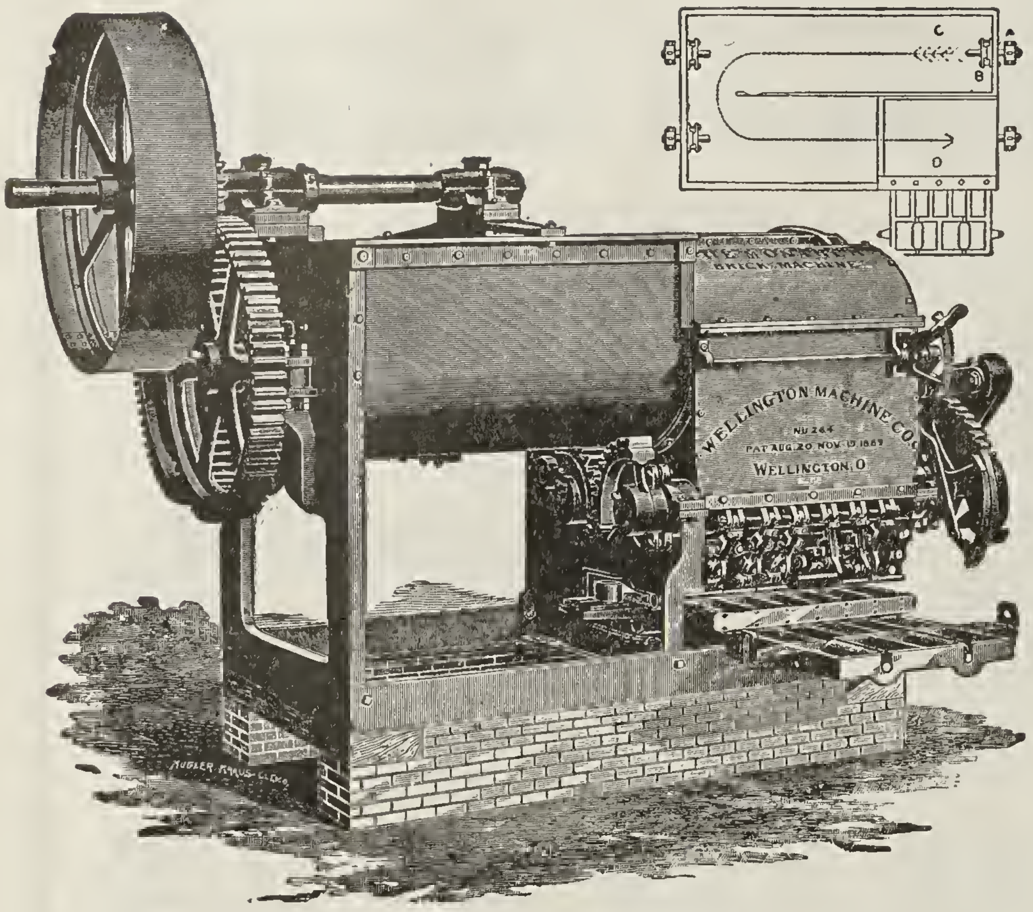
Shipped immediately from stock. **BRICK MOULDS** are a specialty with us.



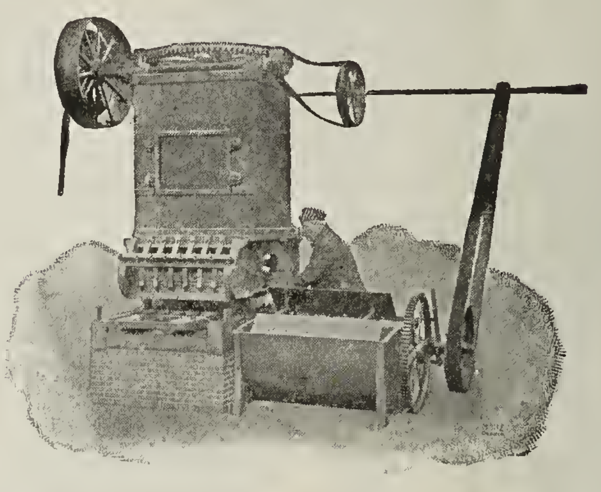
THE HENRY MARTIN
BRICK MACHINE
MFG. CO.
INC.
Lancaster, Pa., U. S. A.



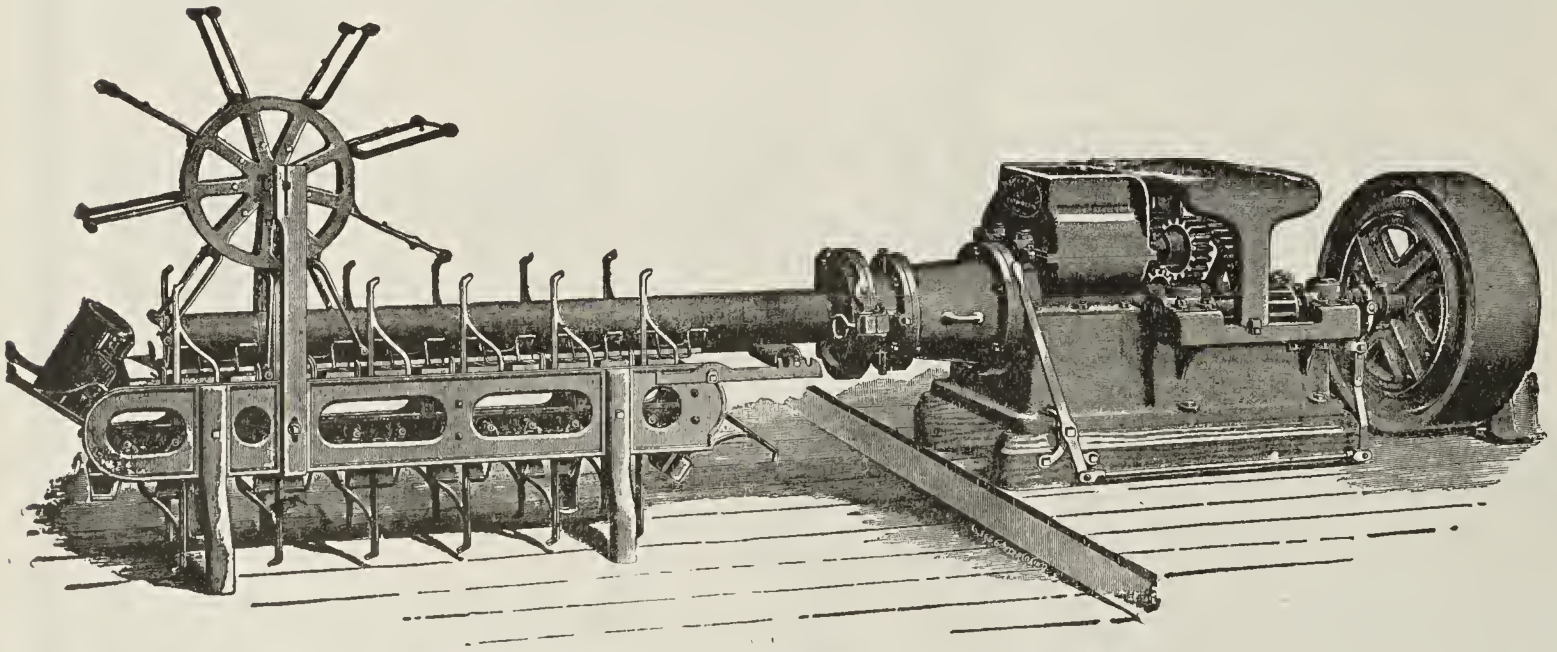
BRICK and TILE MACHINERY


WELLINGTON MACHINE CO.
No 264
PAT AUG 20 NOV 15 1887
WELLINGTON, O.

MONARCH STOCK BRICK MACHINE
Capacity, from 30,000 to 50.000

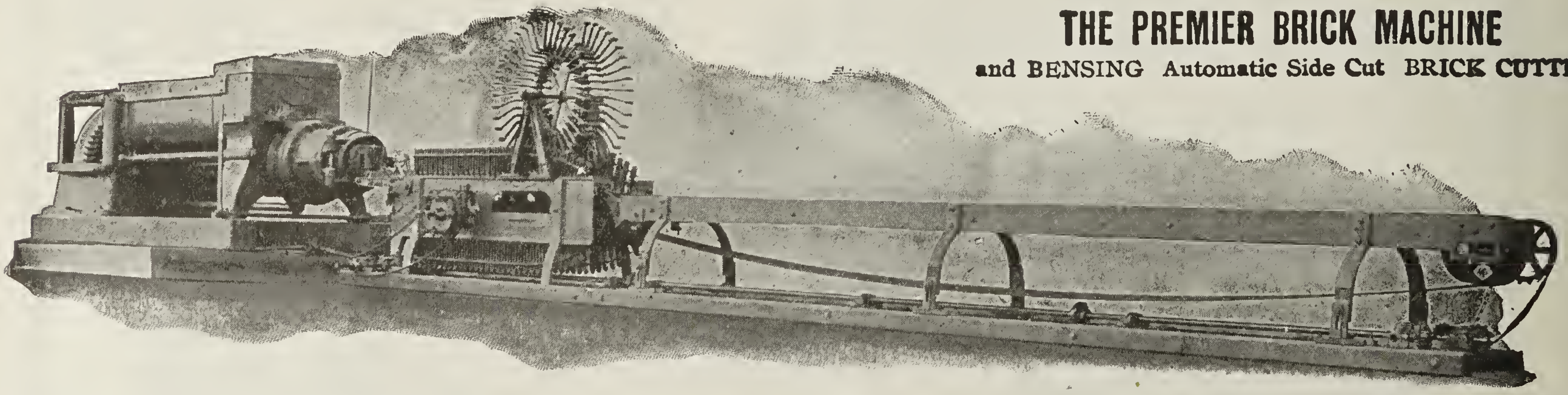


THE QUAKER
Horse or Steam Power. Capacity, 20,00 to 35,000



BRICK OR TILE MACHINE, WITH AUTOMATIC TABLE

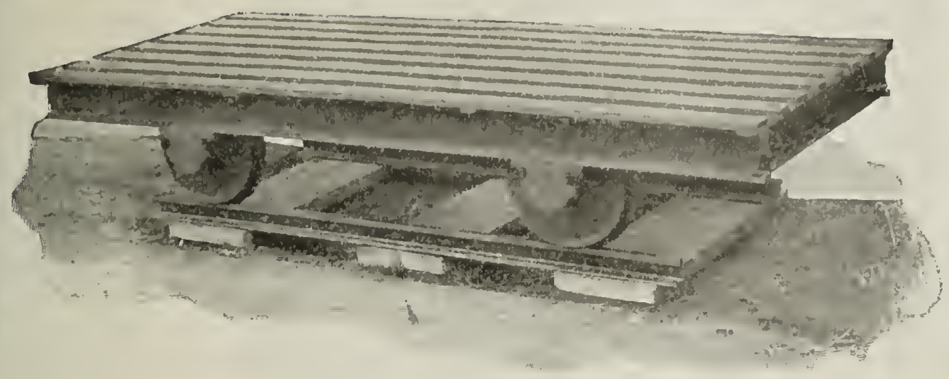
"We Fulfill our Guarantees."



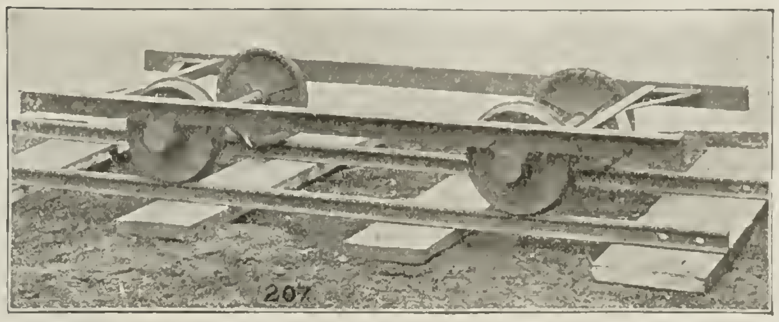
THE PREMIER BRICK MACHINE
and BENSING Automatic Side Cut BRICK CUTTER.

We have a full line of Clay-Working Machinery, sand mold brick machines, auger brick and tile machines, Automatic side and end cut tables, dies, molds, barrows, trucks, sanders, represses, pug mills. *The only down cut, reel side brick cutter on the market for cutting face brick that do not require repressing.* We can guarantee to make you a better face brick with this cutter than you can get from any other cutter on the market.

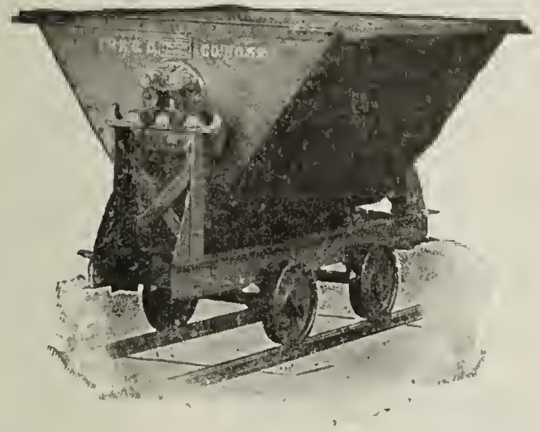
B. E. LaDOW, 701 Dwight Building, KANSAS CITY, MO.



No. 212.
STEEL DECK CAR, CHANNEL FRAME.
For Drying Brick, Sewer Pipe, Etc.



No. 207.
FLAT CAR, WOODEN DECK.
For Brick, Tile, Etc.



No. 52.
TRUNION DUMP CAR.
For Handling Coal, Sand, Ashes, Etc.

The Cleveland Car Company

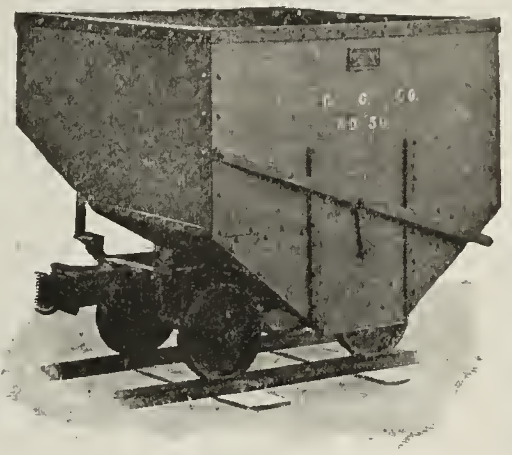
West Park -:- Ohio

Designers and Builders of

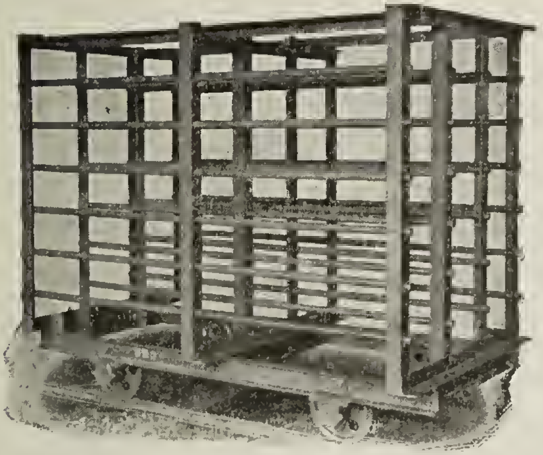
Complete Equipment for Narrow Guage Railroads

Dryer Cars of Every Description, Dump Cars, Turn Tables, Transfer Cars, Switches, Frogs, Rails, Etc.

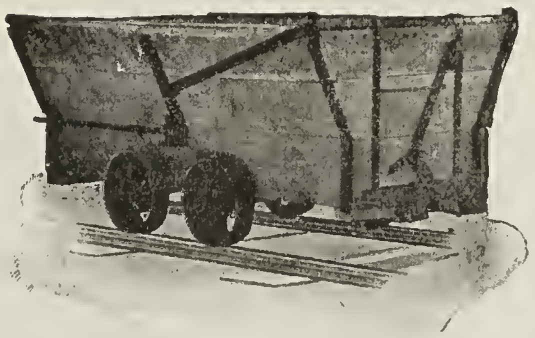
Overhead Trolleys, Kiln Doors, Furnace Fronts, Grate Bars and Brick Barrows : : : :



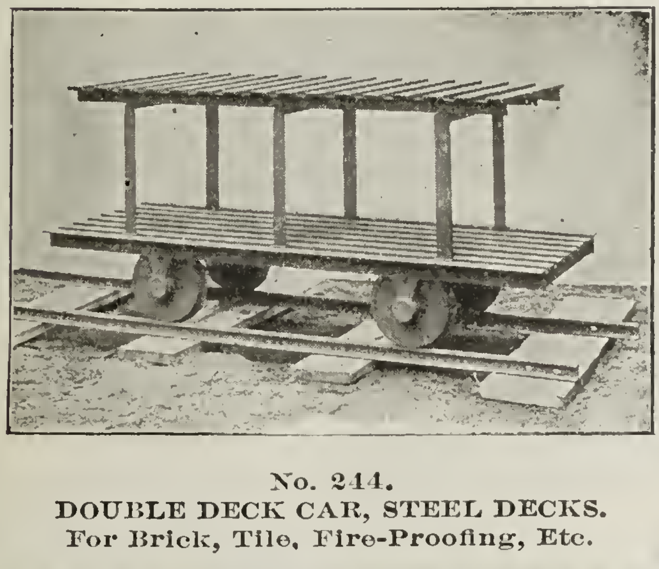
No. 50.
ONE SIDE DUMP CAR.
For Dumping Into Dry Pans, Disintegrators and Crushers.



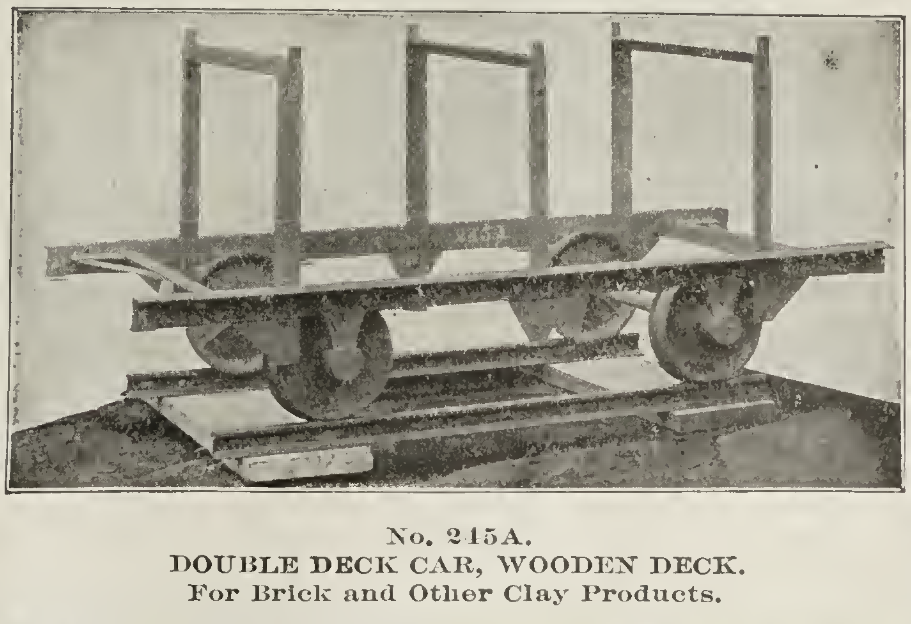
No. 523.
RACK CAR, HEAVY TYPE.
For Use With Coke Oven, Furnace and Cupola Block.



No. 31.
END DUMP CAR.
Adapted to Handling Coal, Shale, Sand, Etc.

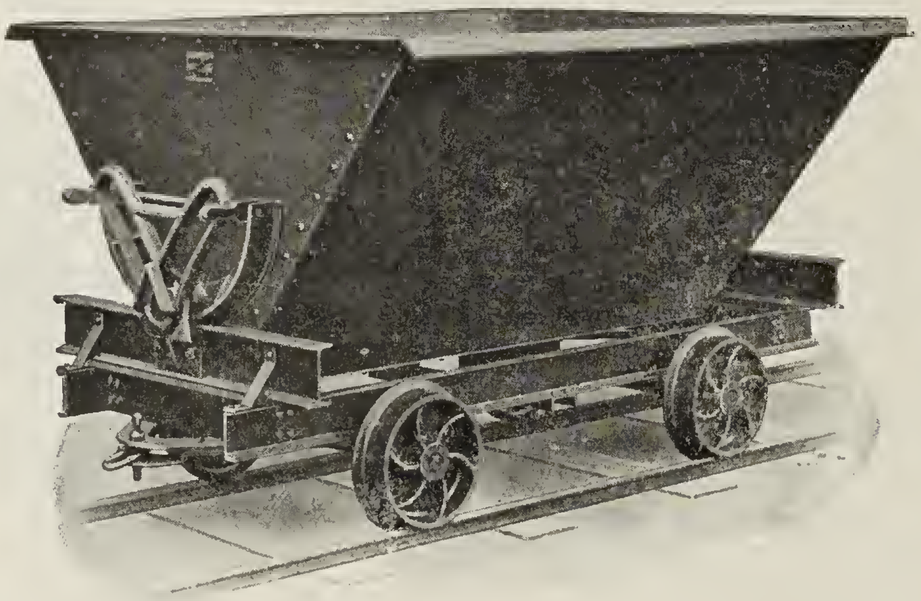


No. 244.
DOUBLE DECK CAR, STEEL DECKS.
For Brick, Tile, Fire-Proofing, Etc.



No. 245A.
DOUBLE DECK CAR, WOODEN DECK.
For Brick and Other Clay Products.

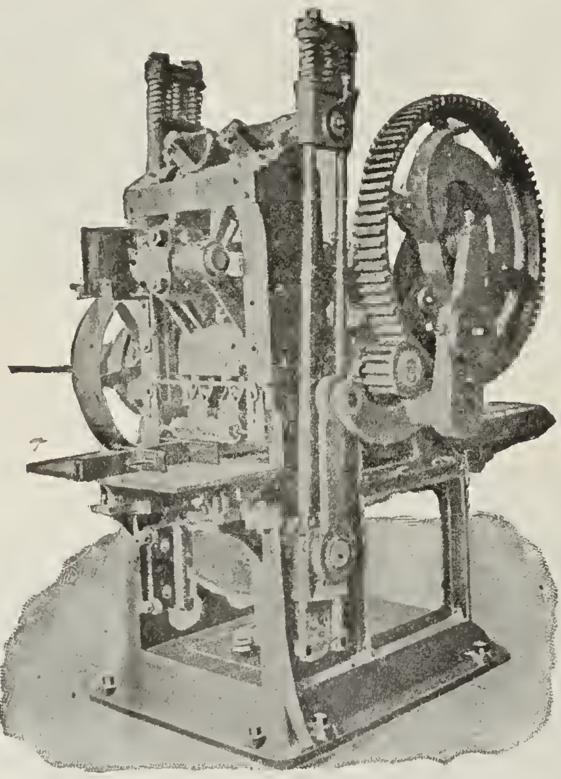
Are Your Clay Cars Satisfactory?



Clay Car.

If not, we can send some which we guarantee will be. They have no chains or pins to get lost or broken, cars cannot overdump, are self-locking, self-centering, easy running and durable.

We also build dryer cars of all kinds for all purposes.

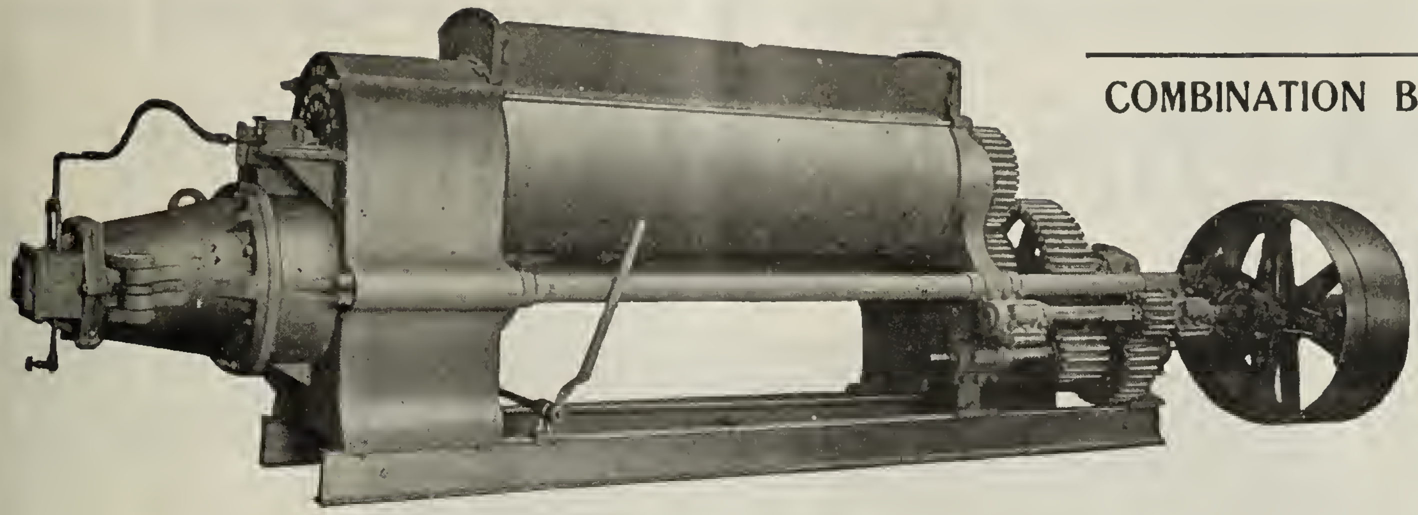


Richardson Double Die Repress.

The Richardson Repress has all the features of merit that are demanded of a machine of this kind. Has enough depth of mold to make the largest size paving brick. All the working parts are above dies out of the way of waste clay. It has a slow pressing movement with double pressure, bringing out distinctly all markings and lettering. The working parts are adjustible to wear. It requires very little power and costs little to keep in repair.

Kindly write us for catalogs and full information.

The Ohio Ceramic Engineering Company
50-56 Fall Street, Cleveland, Ohio.



COMBINATION BRICK MACHINE

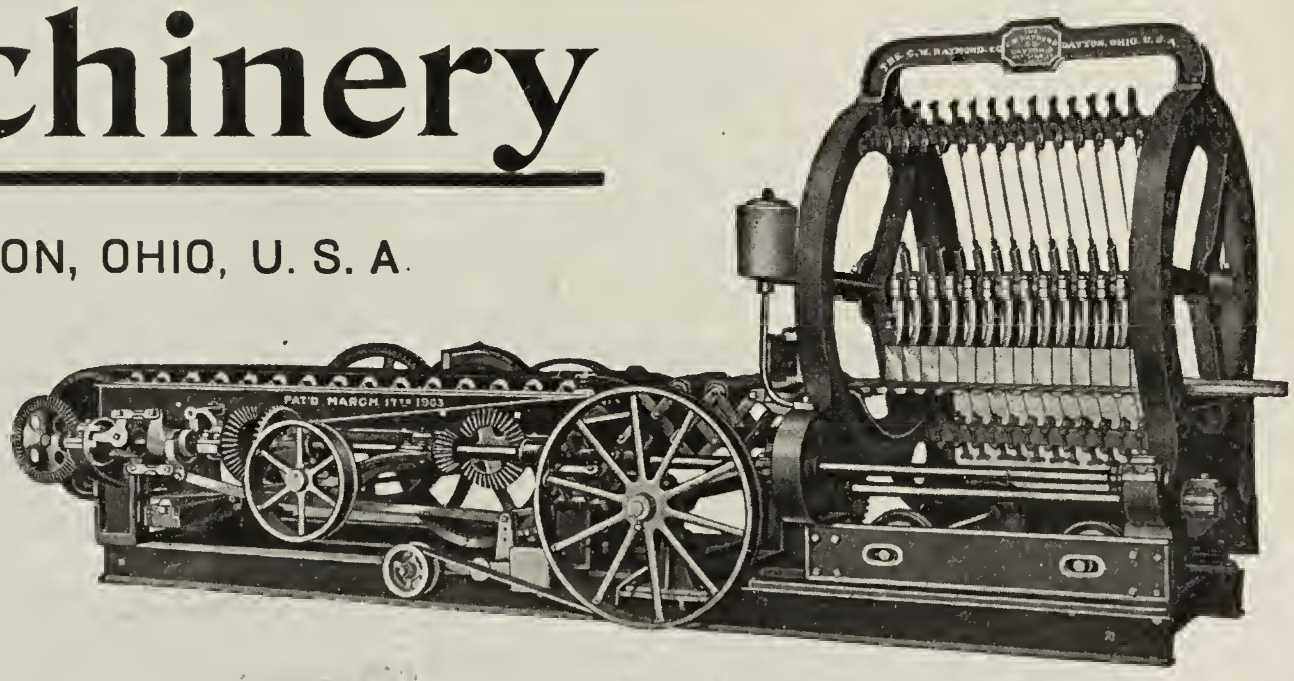
THE

C. W. RAYMOND CO

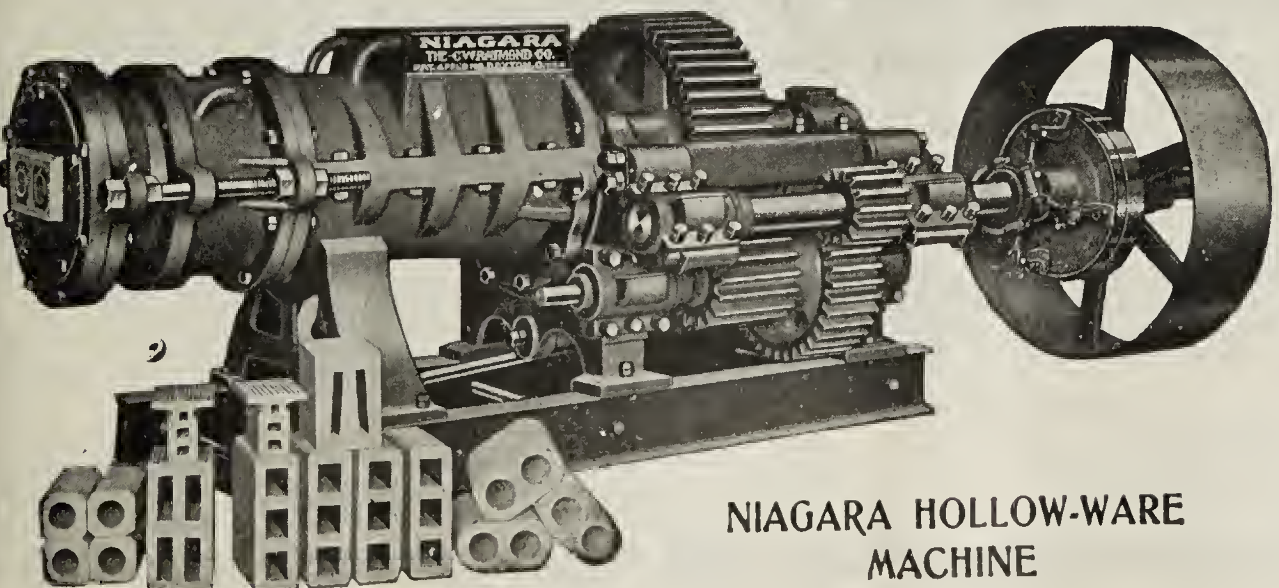
Clay-Working Machinery

DAYTON, OHIO, U. S. A.

NEW YORK
39—41 Cortlandt Street
ST. LOUIS
315 Frisco Building
PITTSBURG
1425 Park Building



AUTOMATIC DOWN-CUT CUTTER

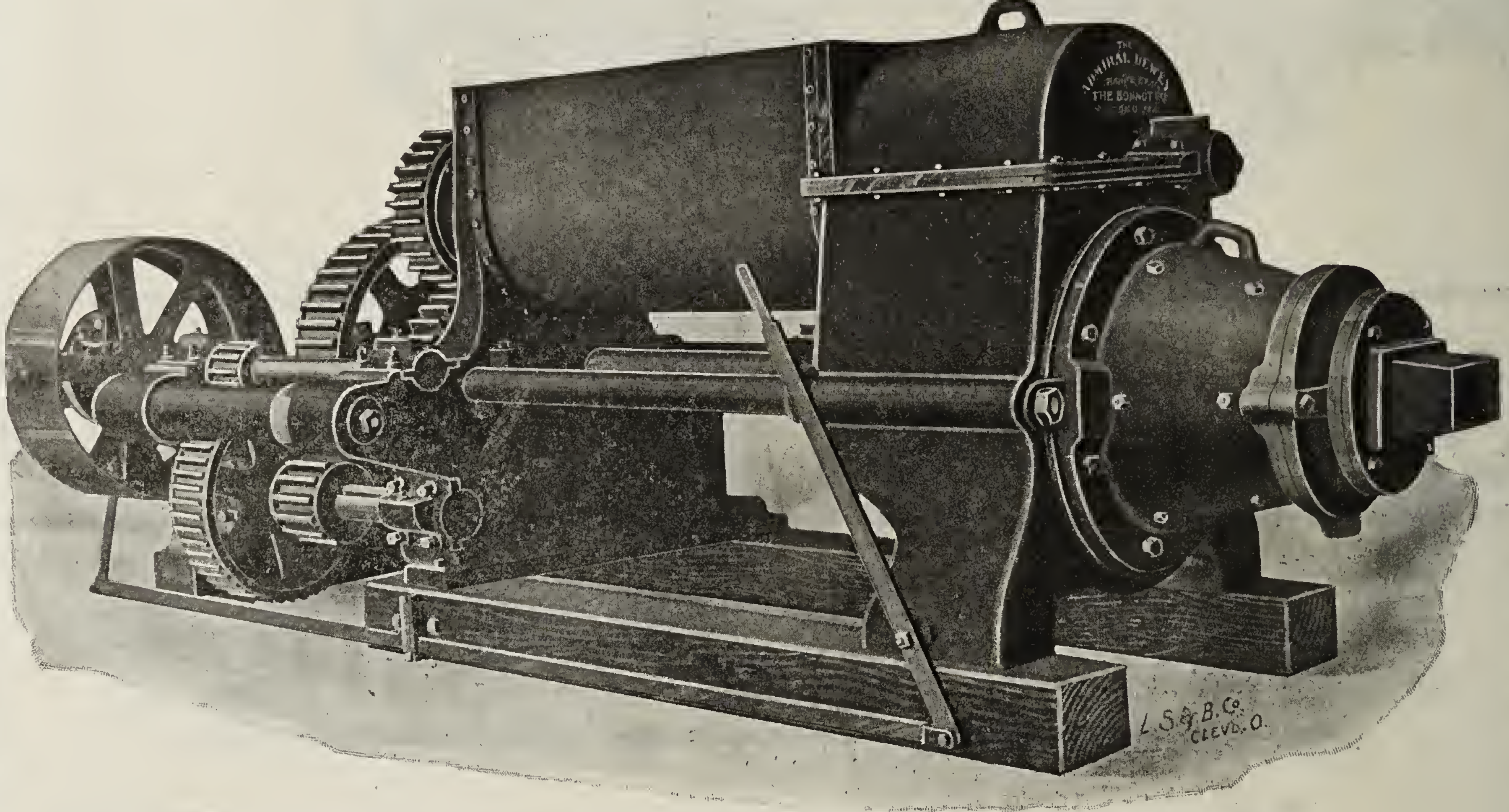


NIAGARA HOLLOW-WARE MACHINE

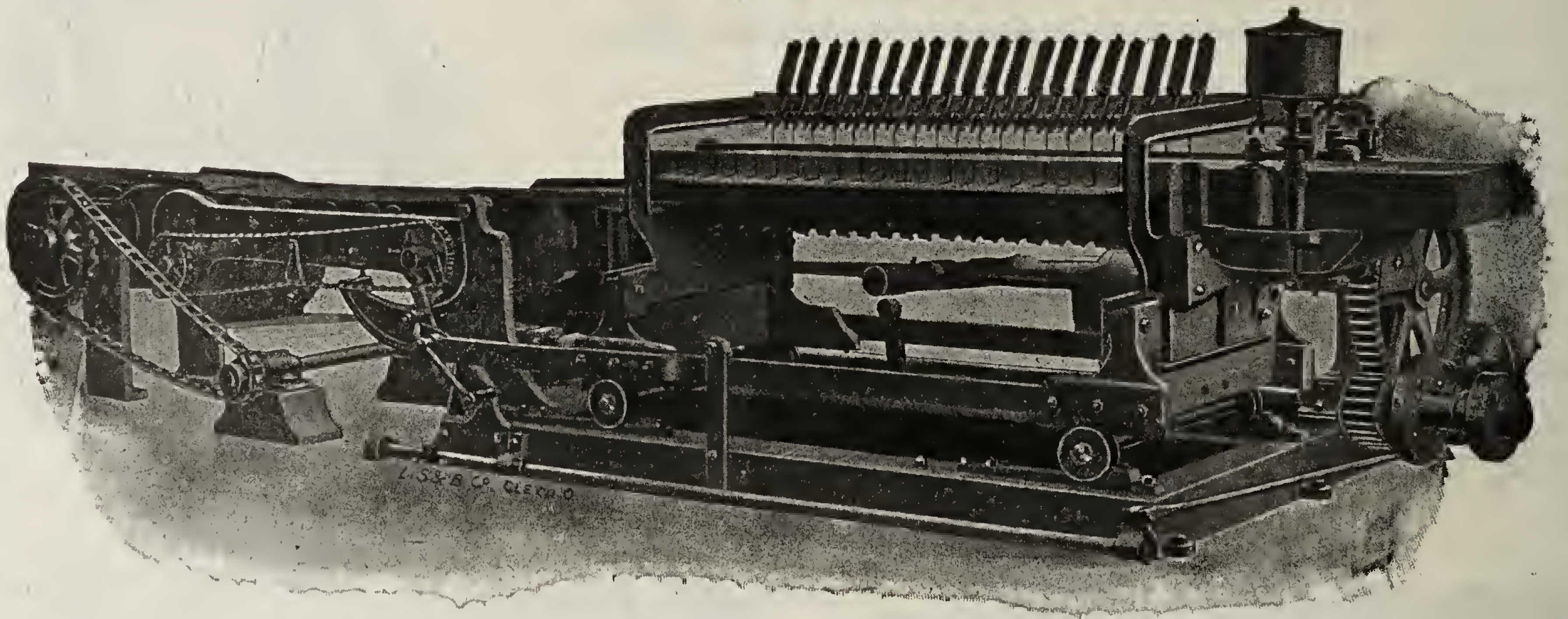
Raymond Machinery
Creates New
Business for the User
Better Brick
and more of them.

CATALOGUE

Modern Brick Machinery


L.S.&B.Co. CLEVD.O.

SPECIAL COMBINED BRICK MACHINE AND PUG MILL 100,000 daily capacity.
AUGER BRICK MACHINES 10,000 to 100,000 capacity, five sizes.


L.S.&B.Co. CLEVD.O.

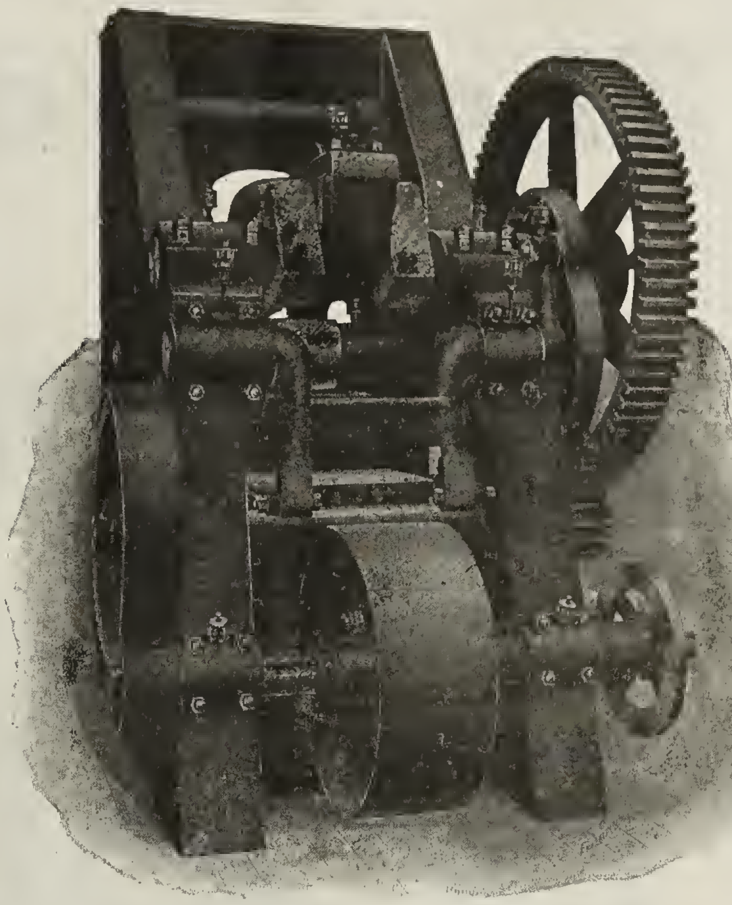
AUTOMATIC SIDE CUT TABLE. Simple, positive, durable.

COMPLETE EQUIPMENTS FOR BRICKMAKERS. *ASK FOR CATALOGUE*

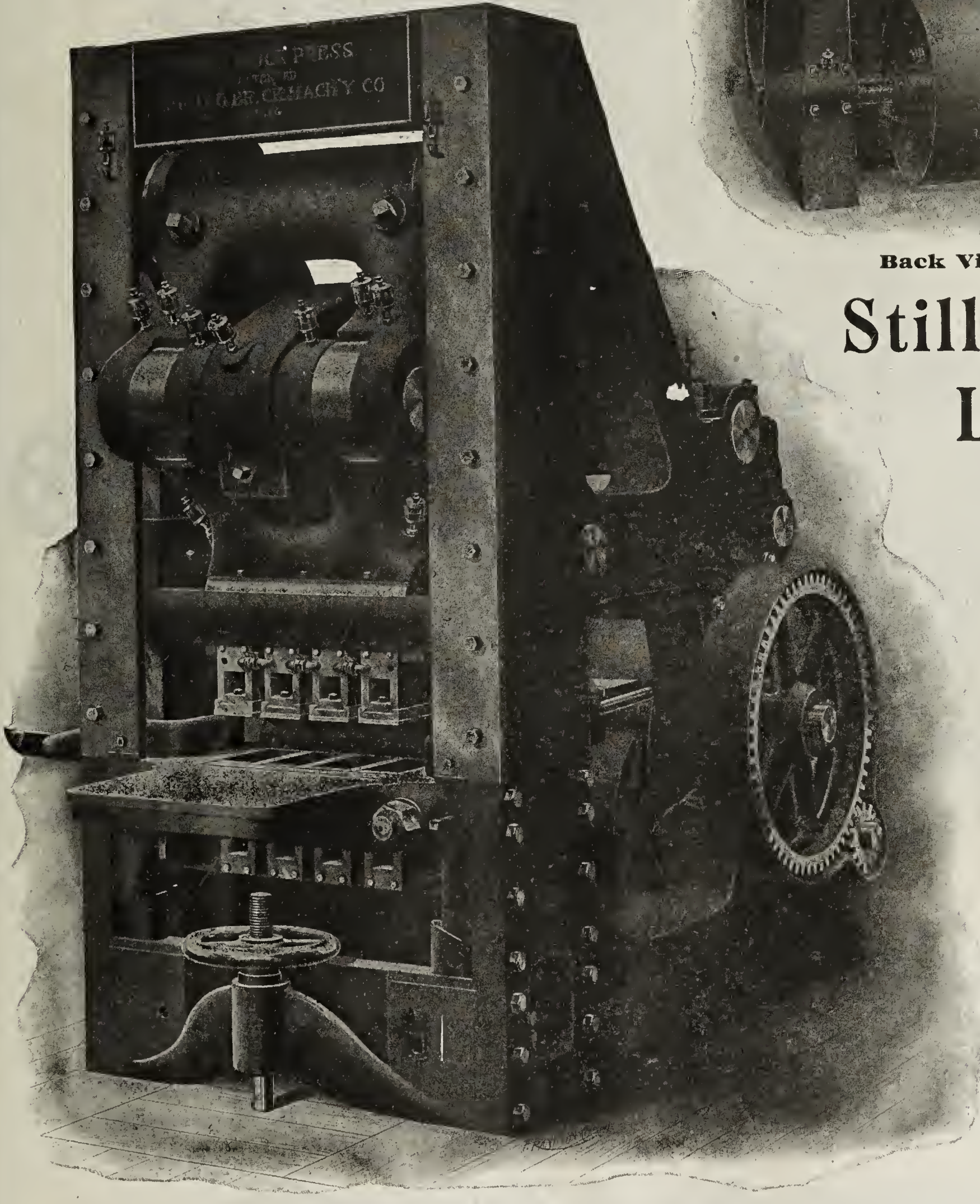
THE BONNOT COMPANY, Canton, Ohio.

—WESTERN AGENTS—
CHICAGO BRICK MACHINERY CO., - - 77 Jackson Boulevard, Chicago, Ill

NEW MODEL
BERG BRICK PRESS



Back View.



Still in the Lead

AND

One Step Further Forward

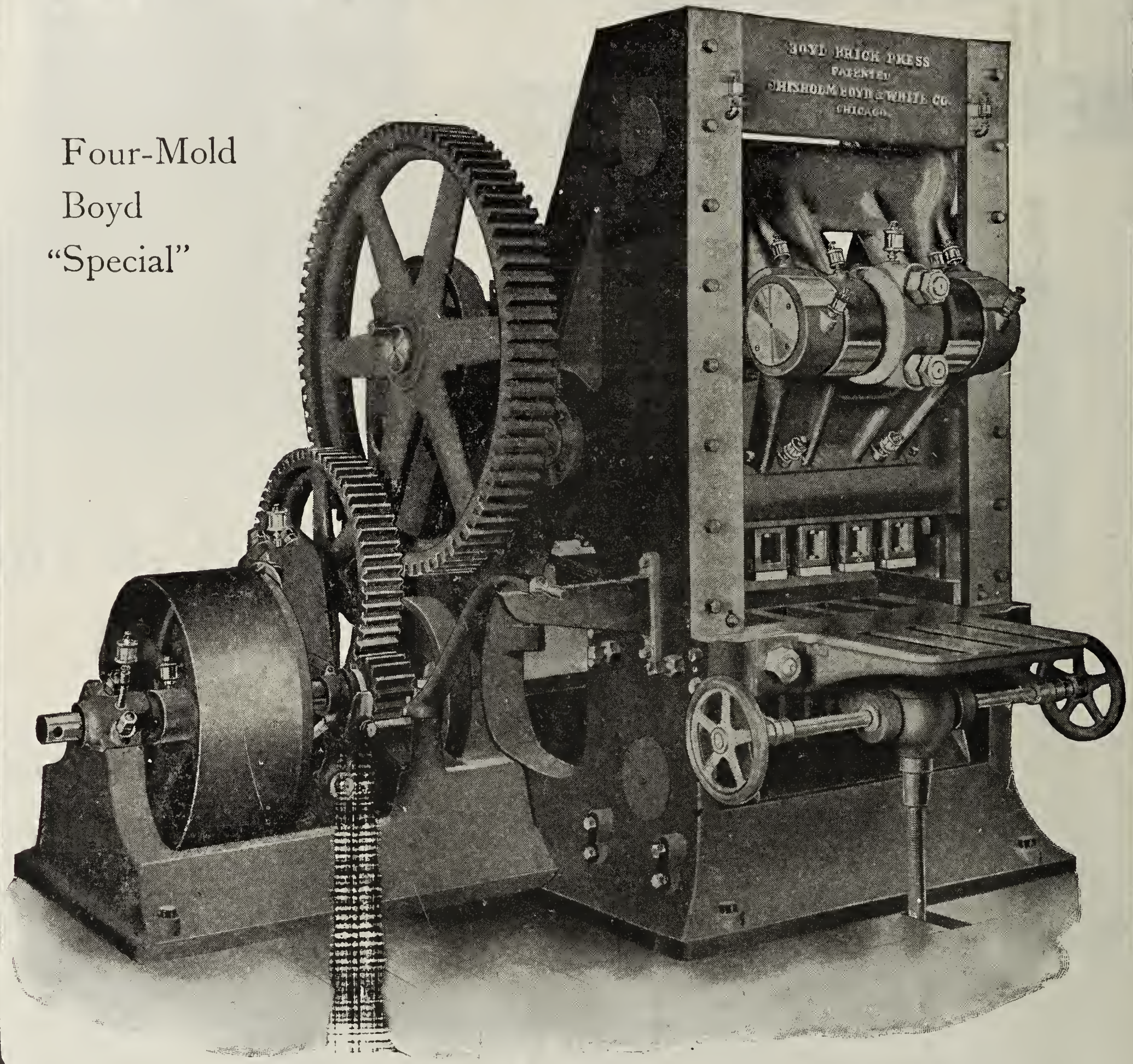
Even stronger than ever and all self-contained. Greater pressure and fewer working parts than any other machine. Simple, massive, compact. Running mechanism placed in rear, as shown in upper cut, enabling this machine to be SHIPPED IN ONE PIECE.

MANUFACTURED BY
ANDERSON FOUNDRY & MACHINE WORKS
Anderson, Indiana.

SOLD BY
CHICAGO BRICK MACHINERY COMPANY
77 Jackson Boulevard, Chicago.

The Boyd Brick Press

Four-Mold
Boyd
"Special"



A Business Proposition.

We will send to any responsible party a **BOYD BRICK PRESS ON TRIAL** and subject to purchase after the making and burning of one or more kilns of brick We take the machine back if not satisfactory.

THE BOYD BRICK PRESS exerts greater pressure, holds it longer, puts more clay into brick, and makes stronger brick than any other Brick Press made. Especially adapted for working shales, and is the only successful machine for making fire brick.

ALL BOYD PRESSES are fitted with our IMPROVED PATENTED MOLD BOX. the liners of which are made of the hardest and toughest known metal, which can be reground at low cost when worn. The molds can be changed in a few minutes.

ITS RECORD : More Boyd Presses in actual operation than of all other Press Brick Machines combined. Write for General Catalogue No. 10.

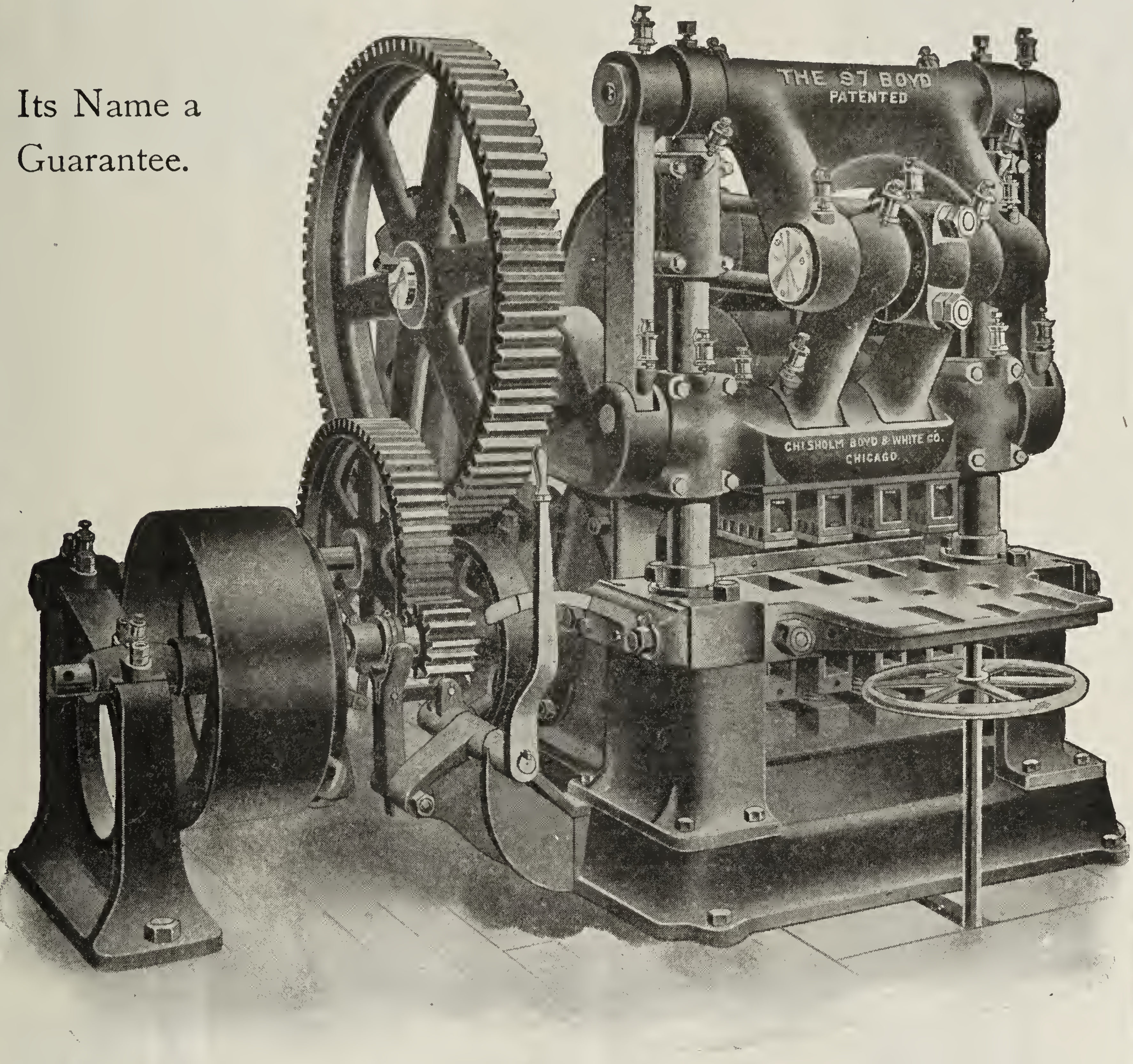
Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

The Boyd Brick Press

The '97 Model

Its Name a
Guarantee.



THE '97 MODEL BOYD BRICK PRESS has enormous strength and great durability; it is compact; the adjustments are convenient; it operates quietly and smoothly; the workmanship and material are of the best; the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking.

THE BOYD is the only Brick Press provided with an independent adjusting device for regulating the amount of clay in the molds and the pressure on the brick. This feature positively ensures equal pressure and finish on both sides of the brick, and no granulated or soft centers.

Sent on trial and fully guaranteed. Seventy presses of this pattern now in use. Cannot be broken in pressing brick. Write for descriptive catalogue No. 9.

Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

Adopted and Purchased by the United States Government for use in the Federal Prison at Ft. Leavenworth, Kansas.

Ross-Keller Triple Pressure Brick Machine Co.

SOLE MANUFACTURERS OF THE

"ROSS-KELLER" TRIPLE PRESSURE BRICK MACHINE
"ROSS-KELLER" 44-INCH DISINTEGRATOR

OFFICES:
FULLERTON BUILDING

THIS PRESS HAS AN UNEQUALLED RECORD IN THE MANUFACTURE OF SAND-LIME BRICK.

St. Louis, Mo., U. S. A., March 15th, 1905.

ANNOUNCEMENT

To meet the demand for a lighter ROSS-KELLER Press than our Triple Pressure Standard Machine, we have designed and are now building a high-grade four-mould press, weight 30,000 pounds, which we recommend to the trade for clays and soft shales, which do not require as great a pressure as is secured in operating our Standard Machine.

Our Standard Triple Pressure Machines (weight 42,000 pounds) are now being successfully operated on Clay, Shale, Sand-Lime and Cement Brickyards, and lead all other Dry Presses on the market. We have a number of these machines now in process of manufacture, and are in a position to make prompt deliveries.

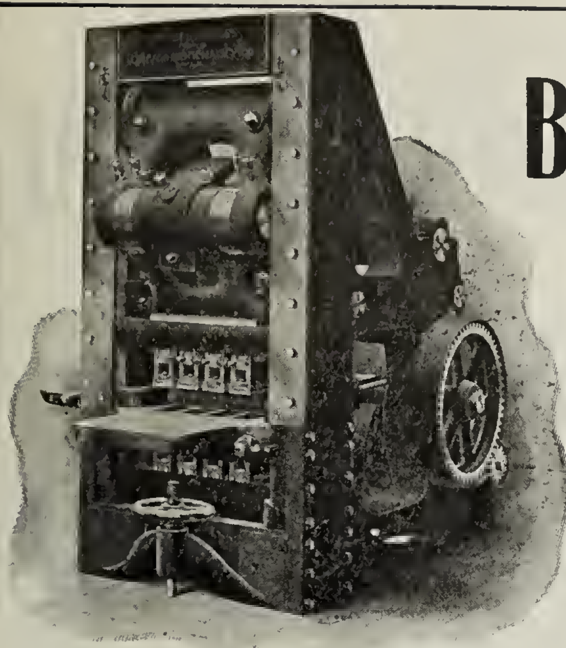
We guarantee both types of machines to be strictly high-grade, and are prepared to make satisfactory prices and terms to manufacturers who are in the market for a dry dress.

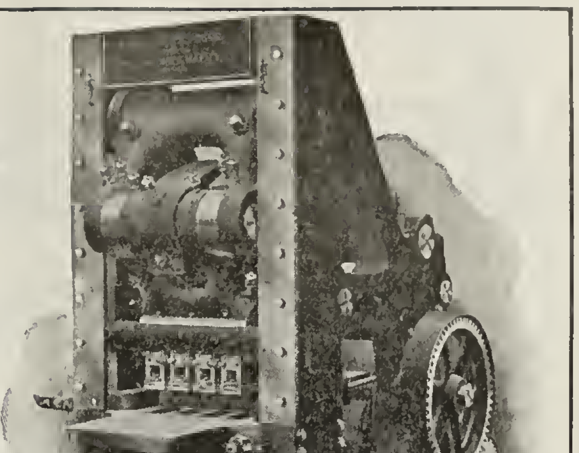
We invite correspondence.

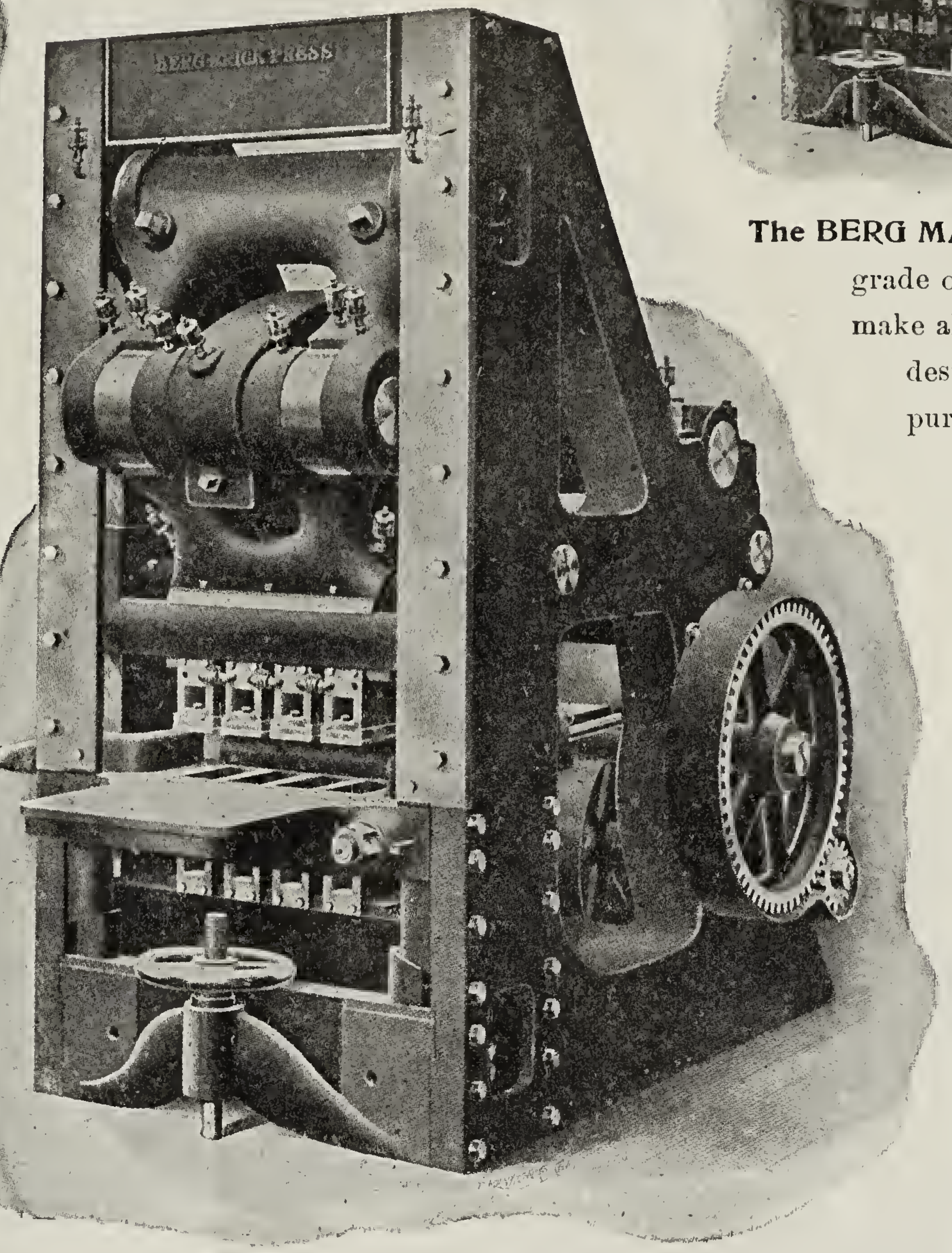
Ross-Keller Triple Pressure Brick Machine Co.
FULLERTON BUILDING, ST. LOUIS, MO

BERG BRICK PRESS

The highest development of the Art of Brickmaking Machinery so pronounced by the United States Government.







The BERG for the highest grade of pressed brick of shale or clay. It makes all kinds of shapes and sizes of brick. Changes from one shape to another can be made in less than an hour's time.

First-Class Workmanship. Cut Gearing. Fully Warranted.

The BERG makes the best sand-lime brick and cheapest because it is the strongest machine and gives the highest pressure. Thirty-five sand-lime plants in United States use the **BERG** Brick Press SUCCESSFULLY.

The BERG MAKES the highest grade of fire brick. Can make all kinds of shapes desired for fire-brick purposes.

Three distinct pressures make the brick evenly pressed all through. No granulated centers of the brick.

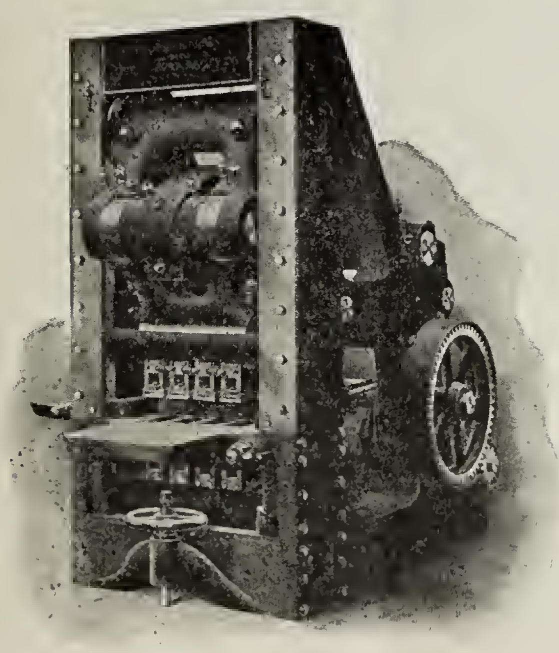
The BERG is the best for sand and cement because of its strong pressure. Uses less cement, makes cheaper brick.

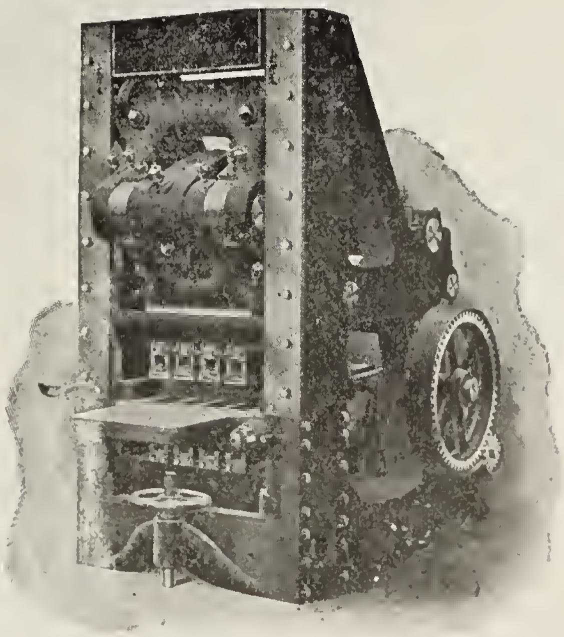
The 1905 Berg Press

Many other steps further forward in improvement and highest grade of material and workmanship, also cut gearing. Fully guaranteed as to its success. Manufactured by its inventor in Toronto, Canada, at the Bertram Engine Works Co. Plans and specifications on the different kinds of plants furnished, also all equipments.

For prices and full particulars, address

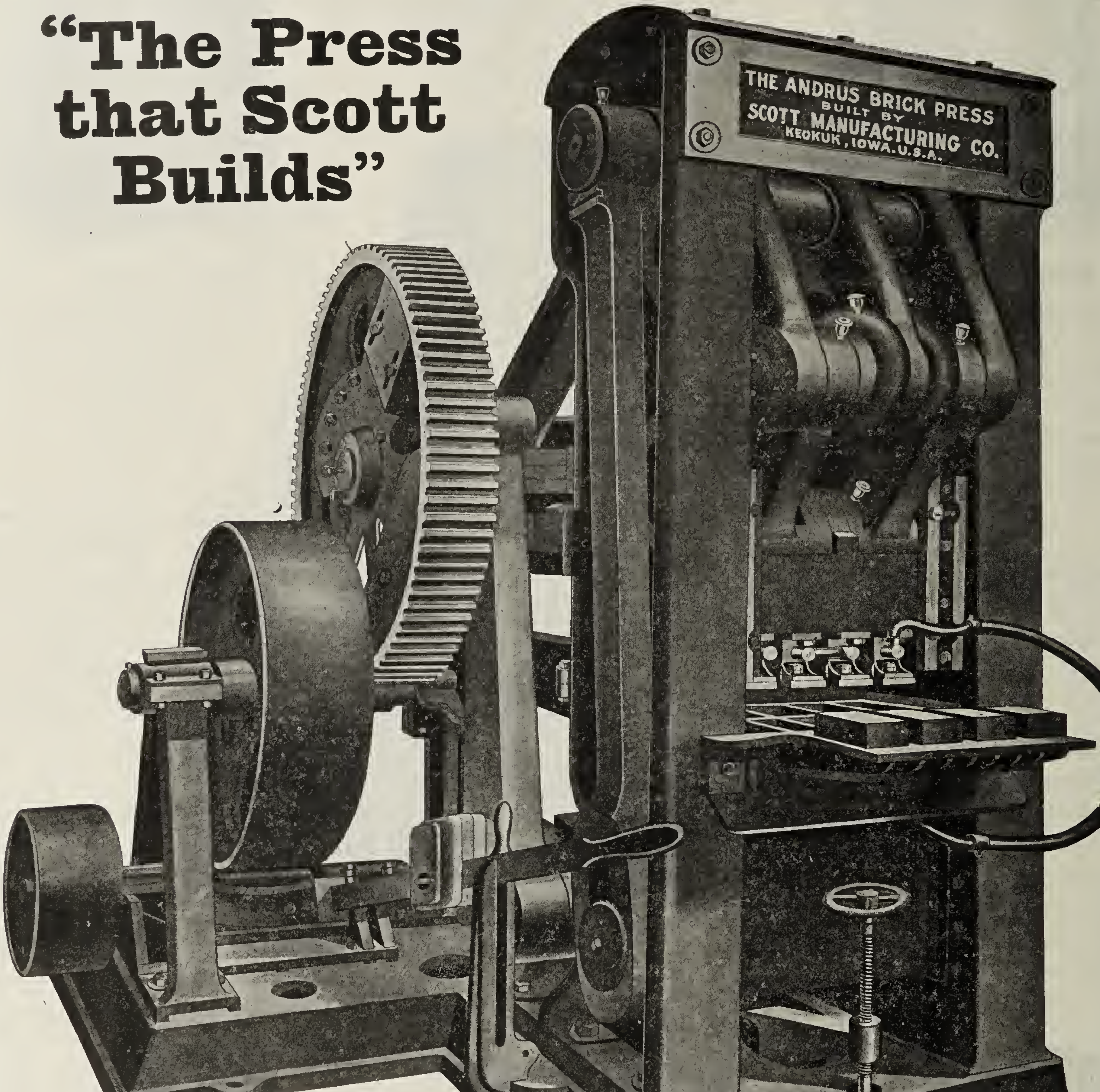
A. BERG
THE BERTRAM ENGINE WORKS
Toronto, Ontario, Canada





One Glance Ought To Convince You

"The Press that Scott Builds"



"Makes Brick every day" because it never takes time to lay up for repairs.

SCOTT MANUFACTURING COMPANY

Works: Keokuk, Iowa. ***ST. LOUIS, MO.***

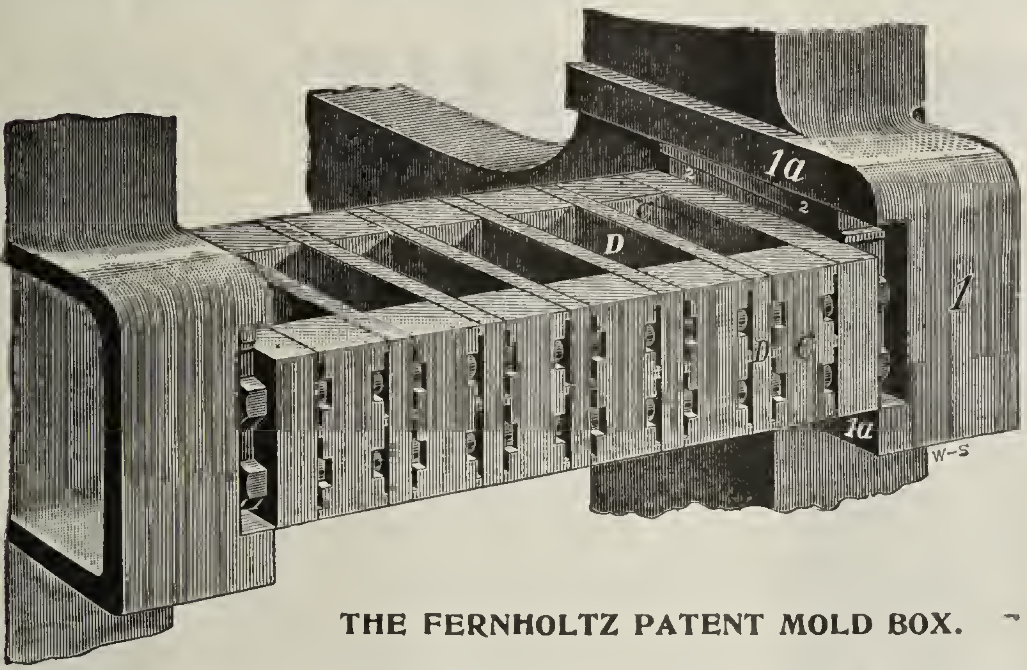
Call and see us in our new office, 609-610 Commonwealth Trust Building.

THE FERNHOLTZ BRICK MACHINERY CO.

Manufacturers of

The Celebrated Fernholtz Dry Press

Four mold Press 20,000 daily capacity. Six mold Press 30,000 daily capacity

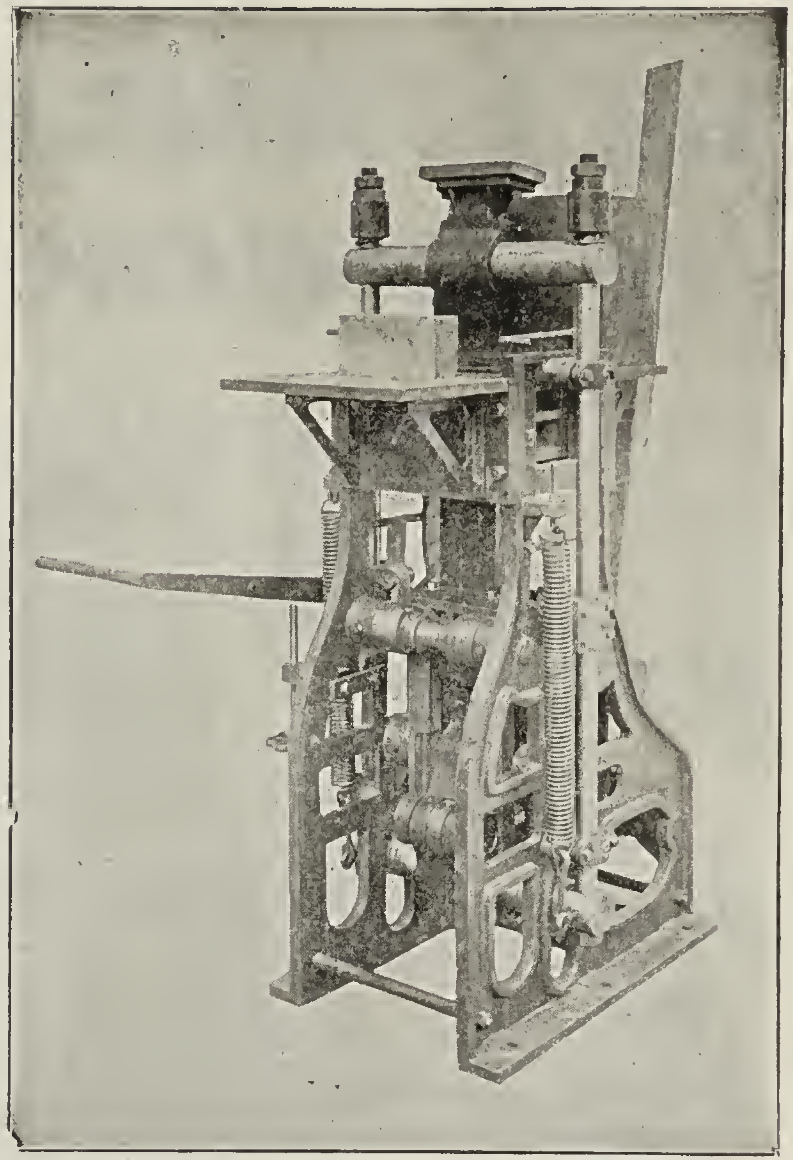


THE FERNHOLTZ PATENT MOLD BOX.

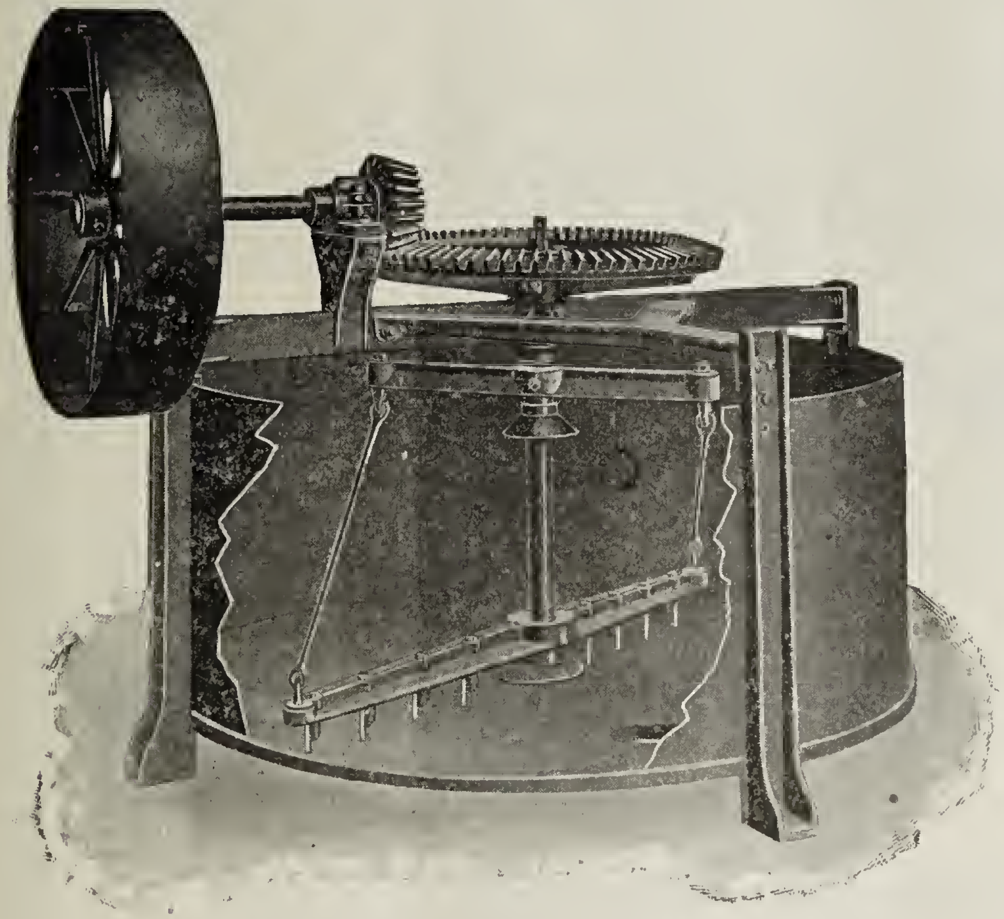
No old style Liners. The Blocks are adjustable and molds are always one size. We have put them in most all makes of Dry Press machines. Easily and quickly adjusted. They are made entirely out of chilled iron, the hardest known metal.

GRATH PATENT HAND POWER PRESS.

Especially adapted for ornamental designs Any size brick up to 12⅝ inches long, 10 inches wide and 4¼ inches thick.
Brick set into kiln direct from press.



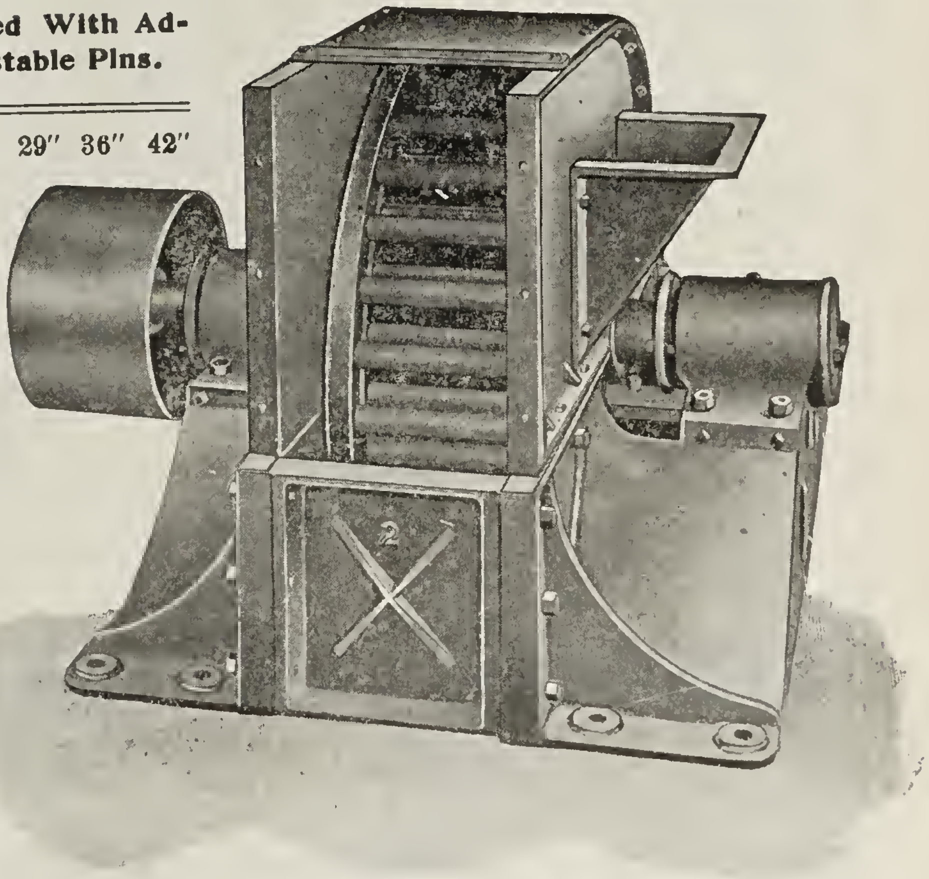
GRATH PATENT HAND POWER PRESS.



A GOOD MIXER IS ALWAYS APPRECIATED.

Fitted With Adjustable Pins.

Sizes 29" 36" 42"



THE FERNHOLTZ CLAY PULVERIZER.

The Fernholtz Brick Machinery Co.

Cable Address "Fernbrick." Western Union Code.

Boyle Avenue and Old Manchester Road, ST. LOUIS, MO., U. S. A.

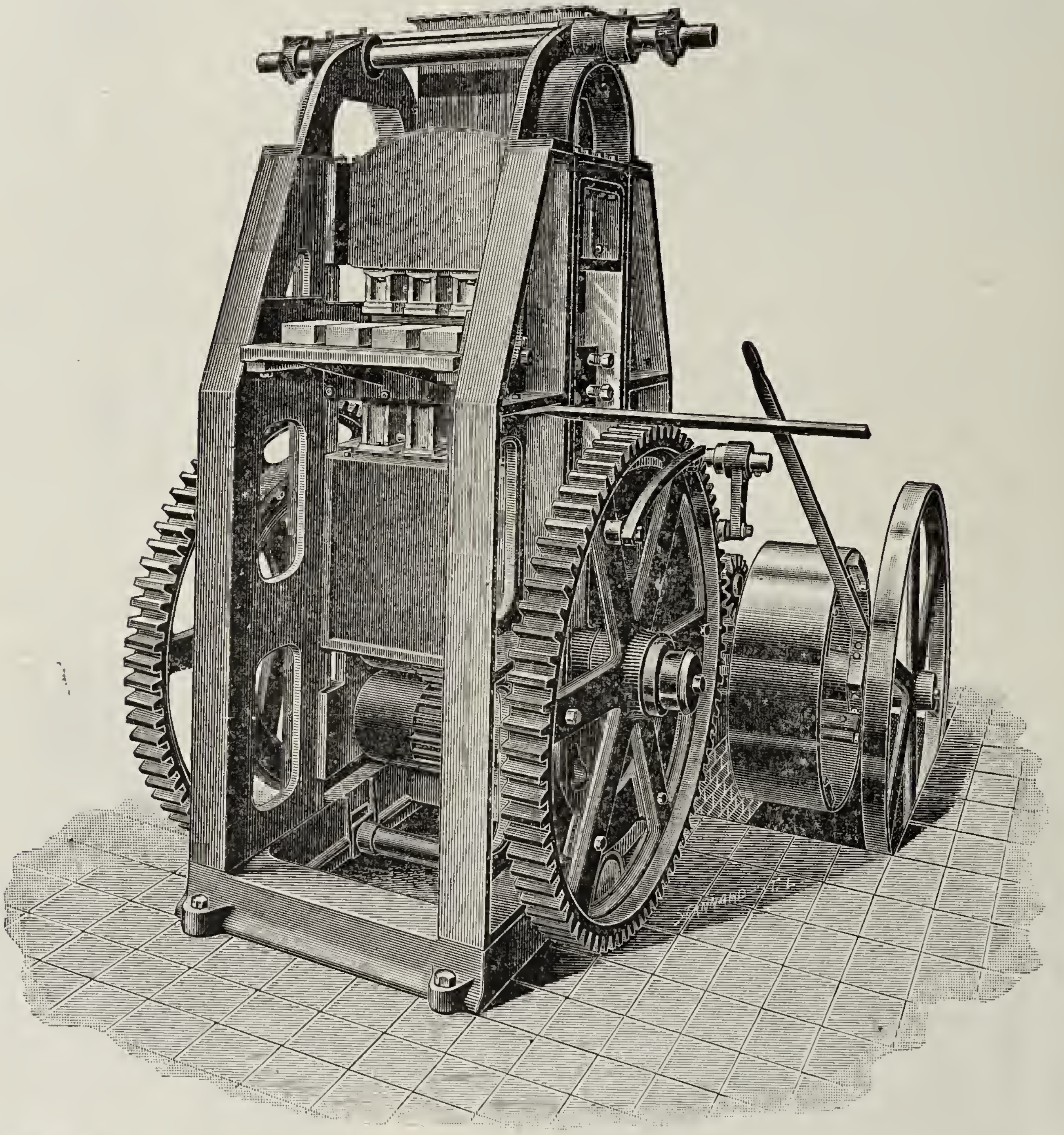
PERFECTION REALIZED

IN THE

RELIANCE DRY PRESS BRICK MACHINE

(PATENTED)

Main
Features:
Strength
Durability
Simplicity
Saves Fuel
and
Costs Less



No
Toggles
No
Links
No
Pins
to
Wear

STRONGEST AND MOST POWERFUL BRICK PRESS ON THE MARKET

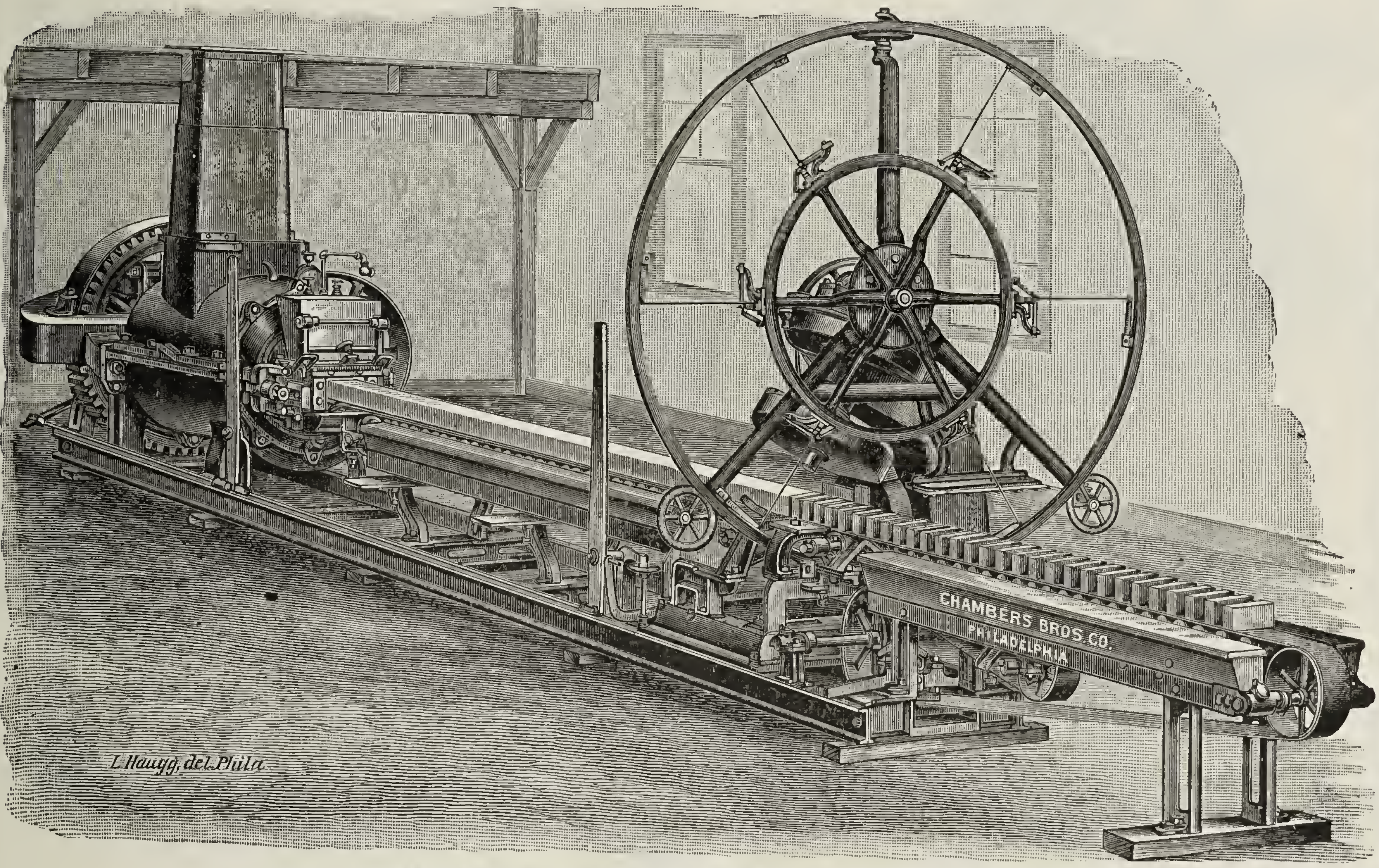
FOR PRICES AND FURTHER PARTICULARS ADDRESS THE

RELIANCE MACHINE AND TOOL WORKS
ST. LOUIS, MO.

MACHINERY FOR BUILDING BRICK

AND FOR STREET PAVERS

ROUND CORNER PAVING BRICK WITHOUT REPRESSING


CHAMBERS BROS. CO.
PHILADELPHIA
L. Haugg, del. Phila.

THE CHAMBERS AUTOMATIC SIDE-CUT BRICK MACHINE.

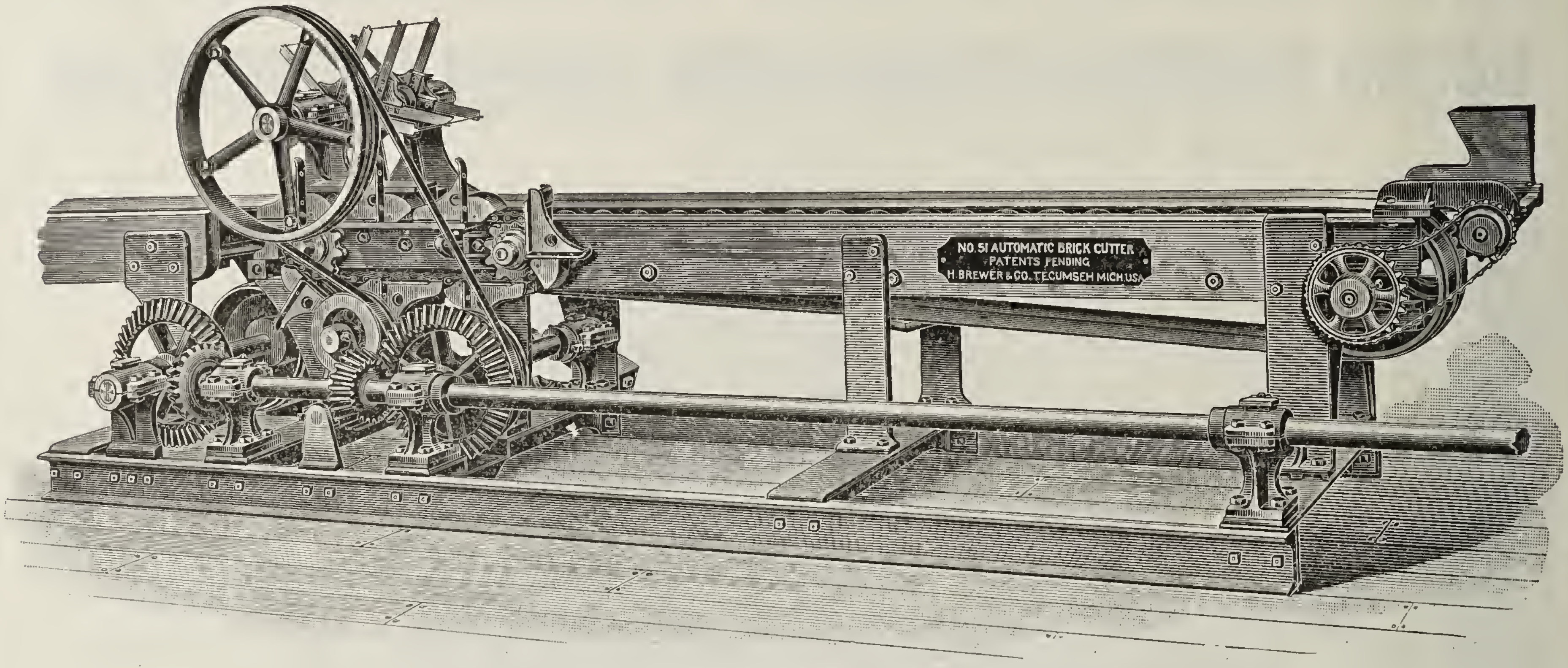
Automatic End Cut Brick Machines of five sizes, having capacity from 10,000 to over 100,000 brick daily under favorable conditions.

CHAMBERS BROTHERS COMPANY

52D AND MEDIA STREETS
PHILADELPHIA, PA.

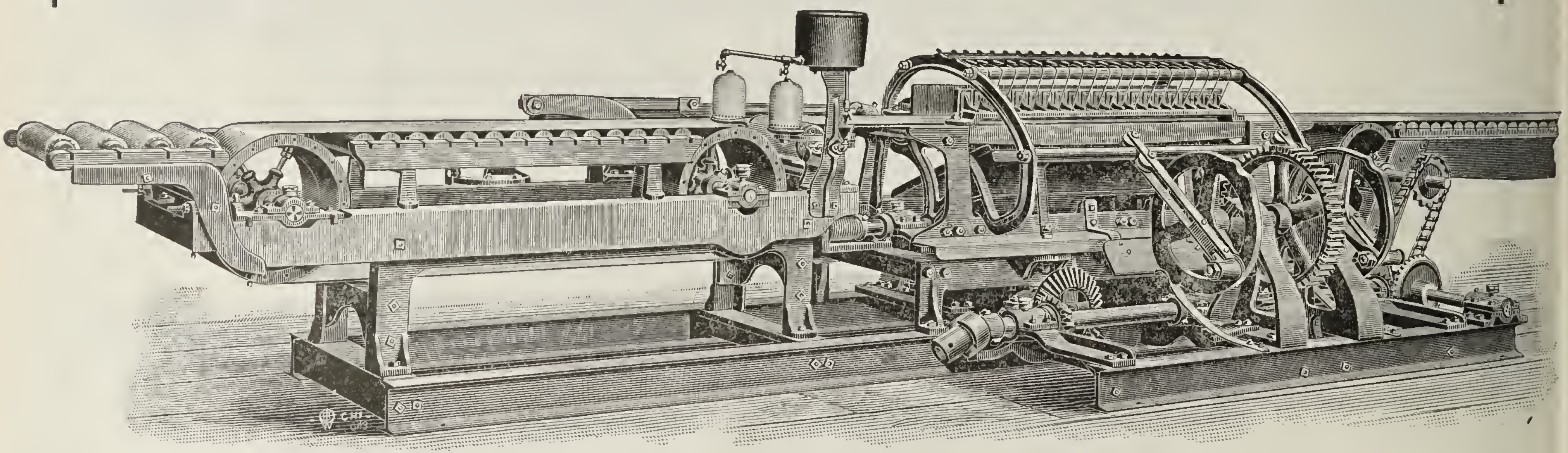
E. R. FRAZIER, Chicago Agent,
59 West Jackson Boulevard.

Automatic Brick Cutters


NO. 51 AUTOMATIC BRICK CUTTER
PATENTS PENDING
H. BREWER & CO. TECUMSEH MICH. USA

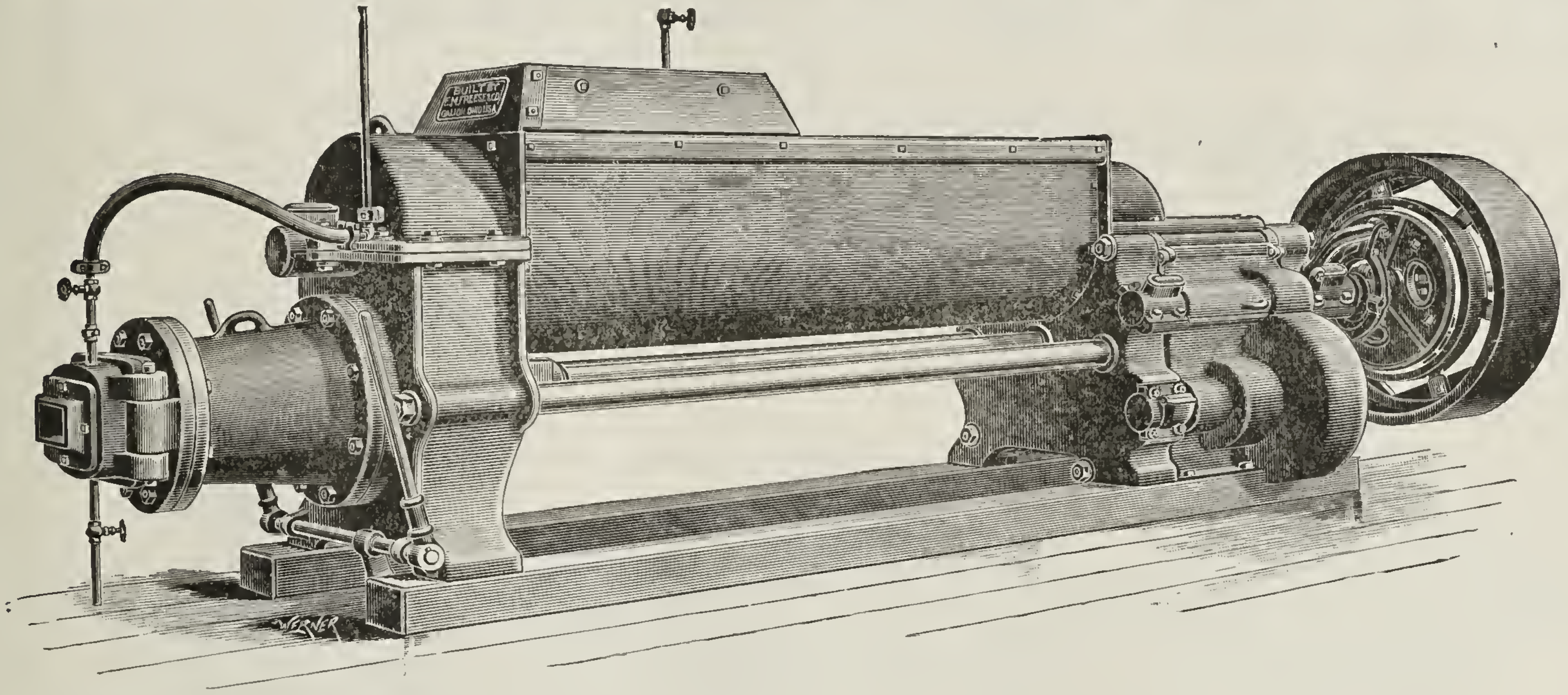
We are producing a line of automatic cutting machinery which is not only extensive but simple and efficient. There are many good things about simple automatic machines. They cost less. They wear longer. They are easier to understand and they work better.

Let us know your requirements and we will quote you some prices.



H. BREWER & CO., TECUMSEH,
MICHIGAN.

UNION BRICK MACHINES



We build these Machines in five sizes. Capacities to 10,000 brick per hour.

Several hundred are in everyday use. They do first-class work and are convenient, economical and durable. This can be verified by investigation.

We also build Brick Machines with separate Pug Mill.

Don't forget our Automatic Cutters. **They give satisfaction.**

State your requirements and let us furnish particulars.

E. M. FREESE & CO.

GALION - - - - OHIO

LAMINATION is the source of more loss, more worry and more anxiety than all other troubles of a brickmaker

---

KENTON C READ, Pres. ANDY O'CONNELL, Vice Pres. and Gen'l Mgr C. M. MILLER, Sec.-Treas.

THE

C. M. Miller Mfg. and Mining Co. Inc.

MAKERS OF

High Grade Veneer and Building Brick

Office, 331 Ohio Street.

New Phone 1142.

Terre Haute, Ind. Dec. 22, 1904.

Mr. H. L. Hix, Mgr.
The Wallace Mfg. Co., Frankfort, Ind.:

Dear Sir—I feel that I must tell you my experience with the brick made on the Intermediate Wonder:—

A few days ago a very prominent contractor asked me to bring him some samples of our brick. I fixed up some samples and started to his place, and just as soon as he saw them, he said: "I don't want them—they are no good; I would not lay one of that kind of brick," but I begged him to look at them and tell me why he did not want them. He asked me if he could break one of them, and I said, "Yes, break all of them." So he took his hammer and hit one on the corner; then he looked up at me and said: "I never saw a stiff mud brick like that;" then he broke it all up, just as nice as any brick, and he said: "That is the first stiff mud brick I ever saw without lamination," and that they were all right.

We are now selling our brick as fast as we can deliver them.

Pardon me for taking your time, and with SUCCESS to the WONDER, I am,

Yours very truly,

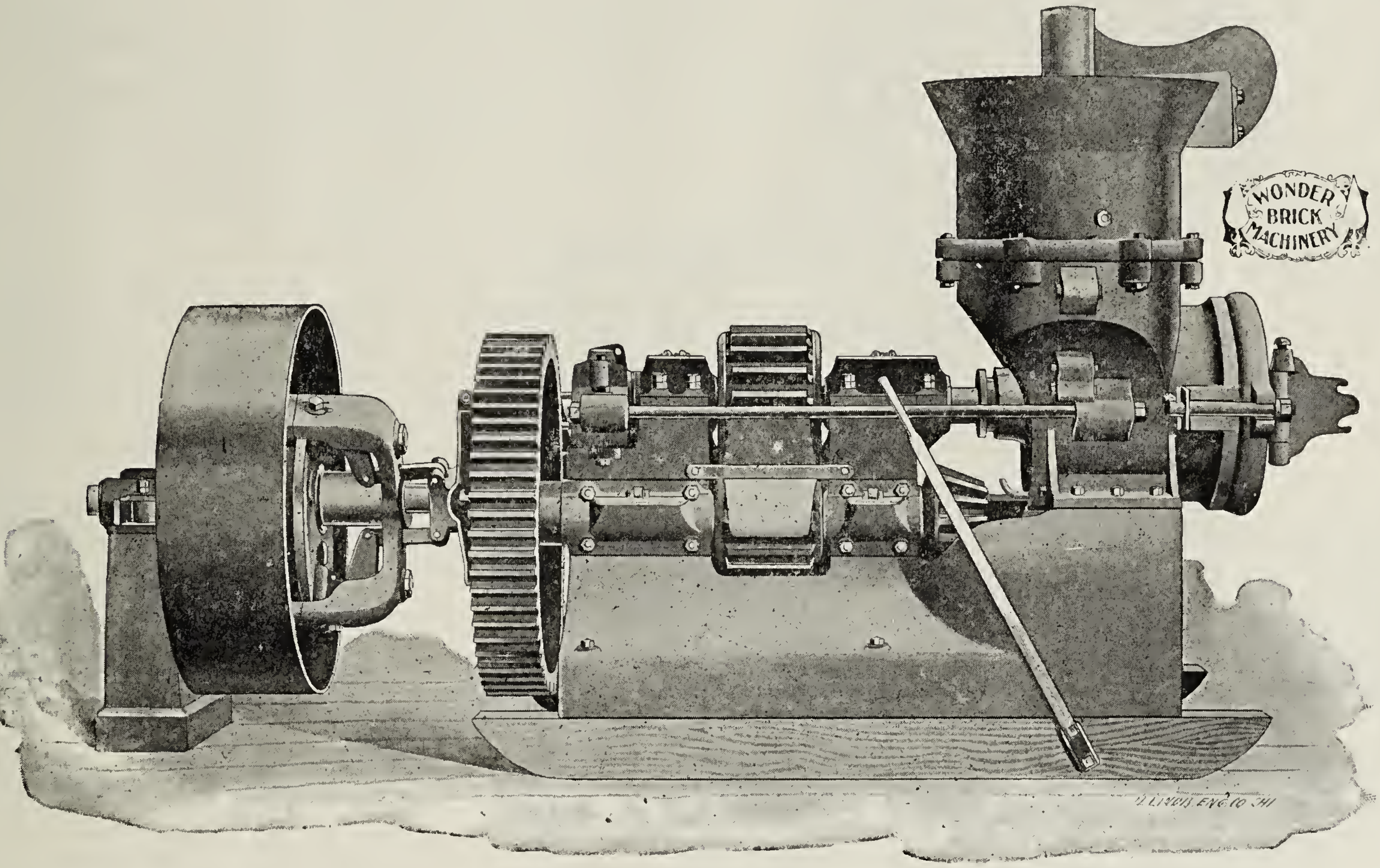
Andy OConnell
V P and Gen Mgr.

In the event that you want to make brick filled with LAMINATION, CRACKS and CROOKS, a Wonder Machine will not answer your purpose.

THE WALLACE MFG. CO.

FRANKFORT, IND., U. S. A.

PRAISED BY EVERY USER



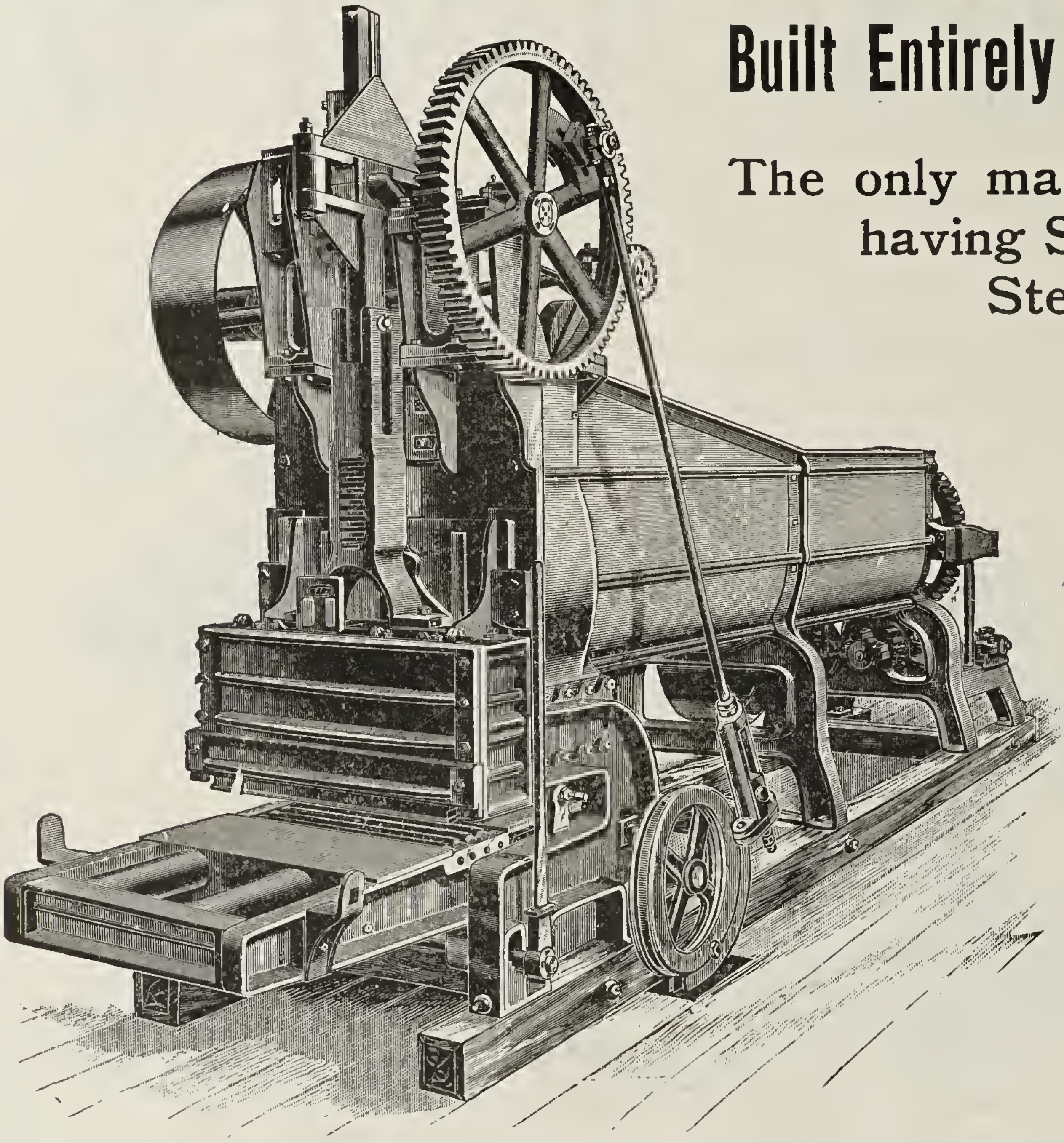
INTERMEDIATE WONDER.

40,000 daily capacity. Meets the requirements of the brickmakers.

The Wallace Mfg. Co.

FRANKFORT, IND., U. S. A.

THE POTTS
HORIZONTAL BRICK MACHINE



Built Entirely of Iron and Steel.

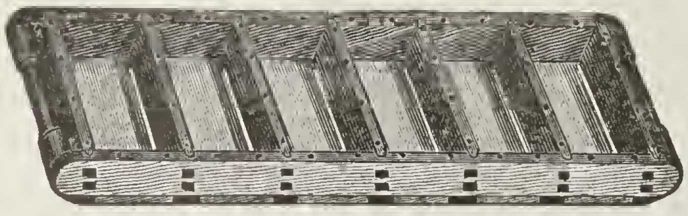
The only machine of this class
having Steel Gear and
Steel Shaft.

Built of the Best
Material by the Best
Workmen.

Simple, Strong and
Durable.

No extra pug mill required to enable working the clay direct from the bank. Its great strength enables working the clay as stiff as practicable, insuring brick which will be STRAIGHT and SQUARE.

THE LEADER OF ALL SAND MOULD MACHINES.



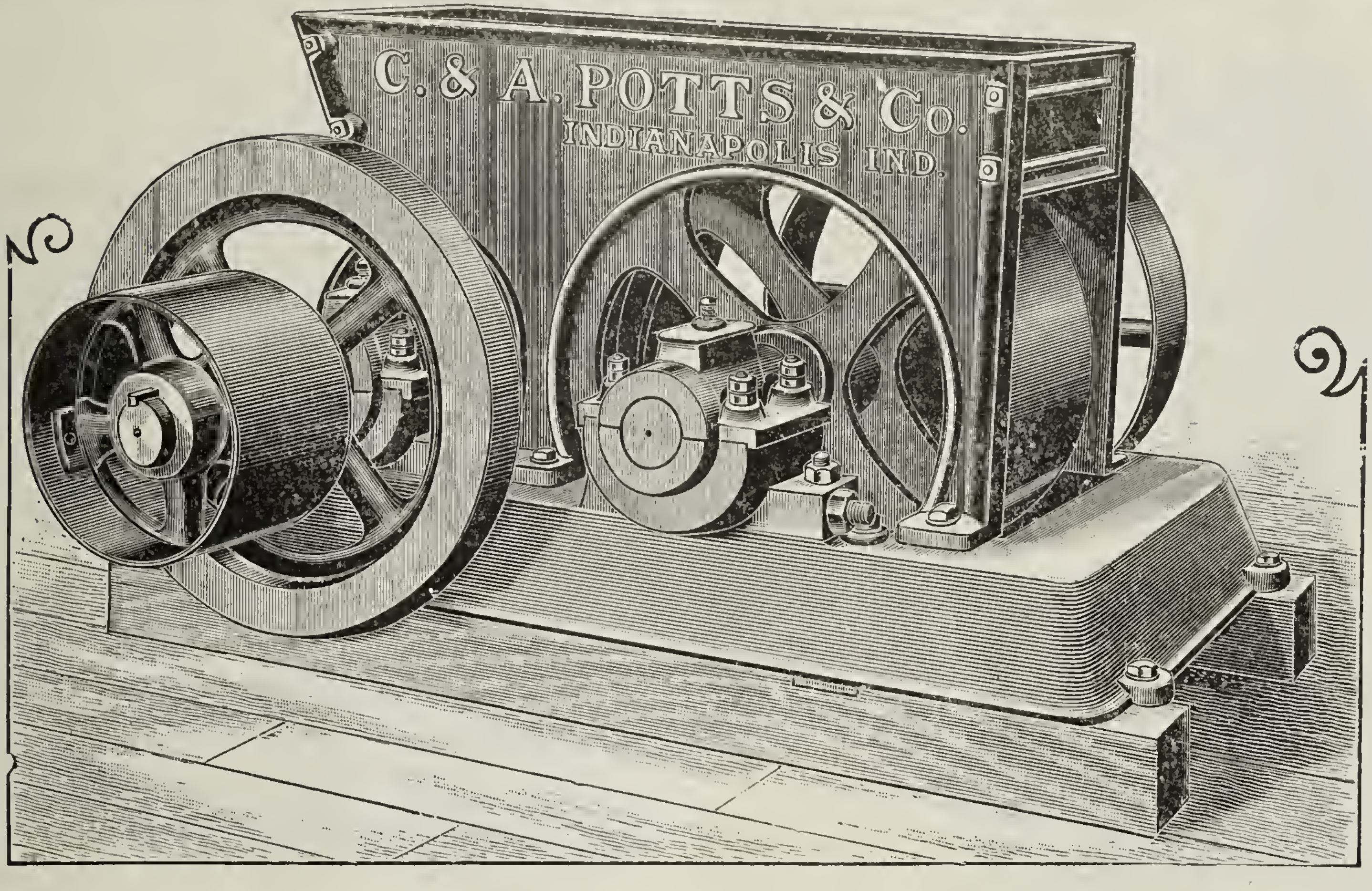
BRICK MOULDS A SPECIALTY

QUALITY IS OUR AIM.

We manufacture a complete line of Brick Yard Supplies. Write for prices.

C. & A. POTTS & CO., Indianapolis, Ind.

THE POTTS DISINTEGRATOR


C. & A. POTTS & Co.
INDIANAPOLIS IND.

Is not a spite machine, but is built the best possible. Having Heavy Chilled Rolls, Ring Oiling Bearings, Shafts of Steel and large in Diameter. The most successful machine for grinding out sticky clays and separating the stone.

THE POTTS MOULD SANDER

Simple in Construction,

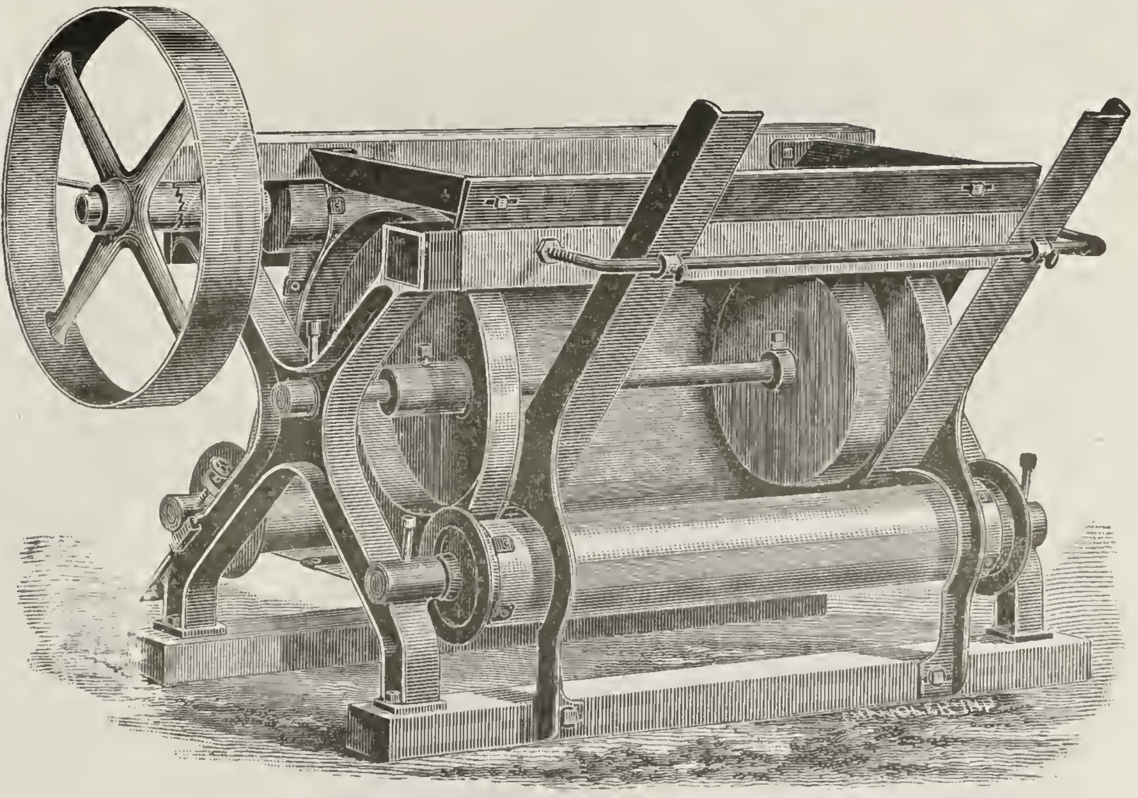
Strong and Durable,

Sands the Moulds Perfectly,

Never Strikes or gets Drunk,

Always Ready for Work,

No Brick Machine Complete without this Machine.



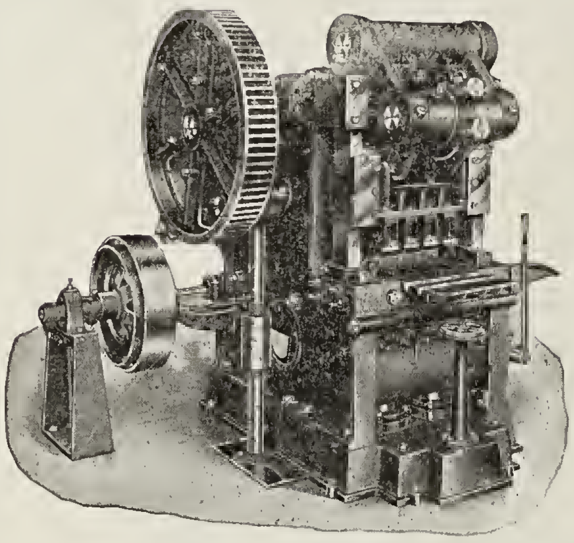
Patented February 5, 1889.

We make a specialty of equipping Sand Mould plants complete. We are the largest manufacturers of this class of machinery in the world. Write for prices.

C. & A. POTTS & CO., Indianaoplis, Ind.

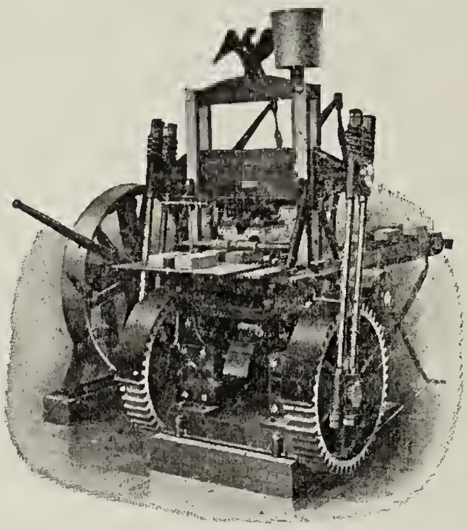
The American Clay Machinery

These are a few of the many Superior machines we manufacture for the Clay Trade. Large cuts



DRY PRESS BRICK MACHINERY.

We build a full line of Dry Press brick machinery. We have four styles and eight sizes, ranging in capacity from 1,000 to 3,000 brick per hour. This cut is our four mold, Moldel B press, especially adapted to Sand-Lime brick. Write for complete catalogue.



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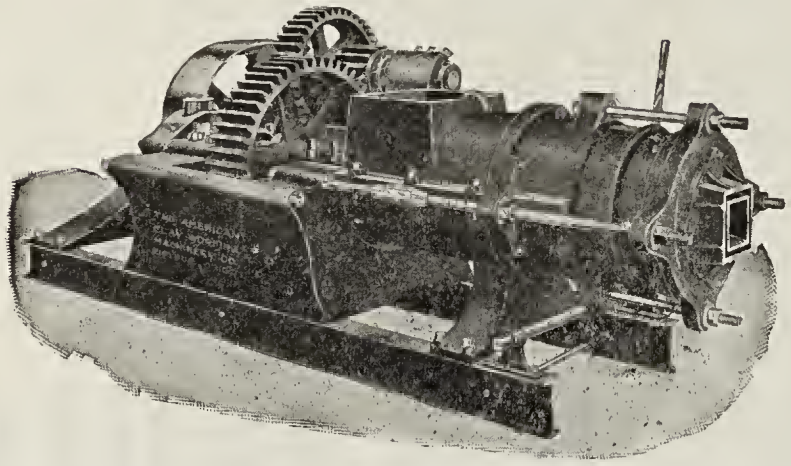

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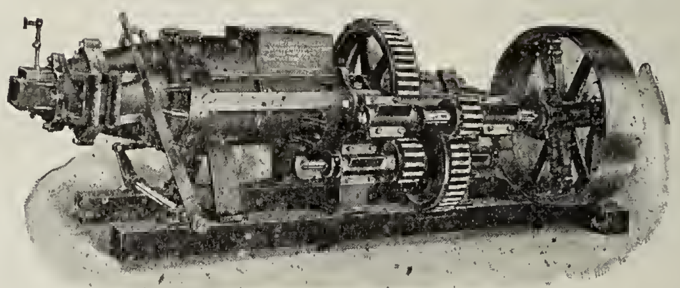

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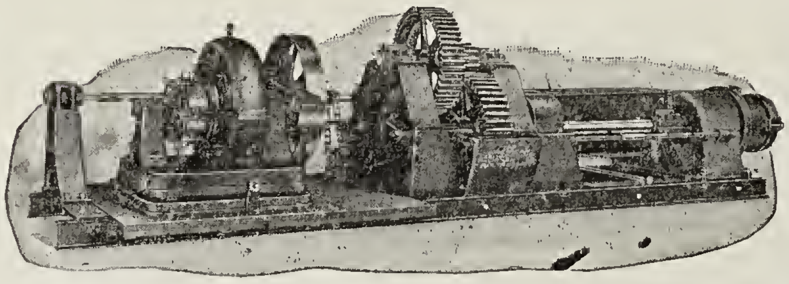

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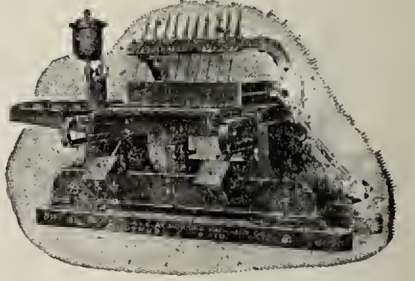

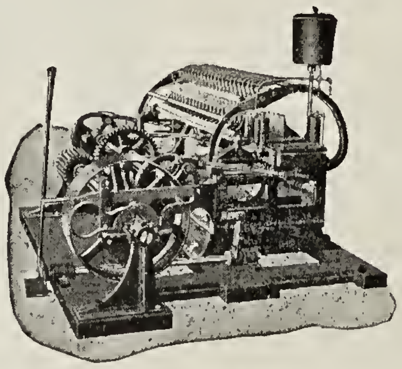

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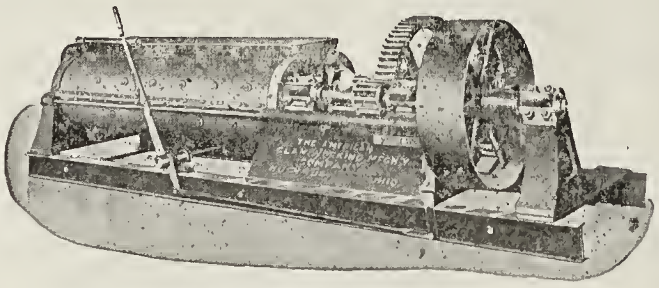

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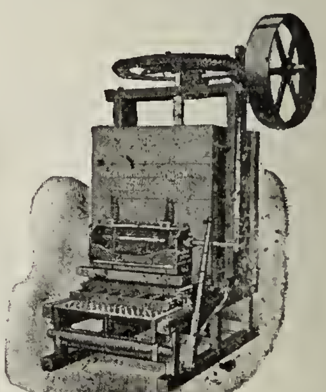

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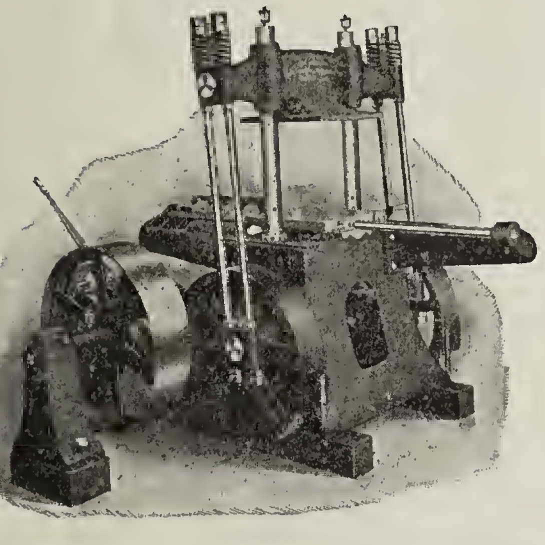

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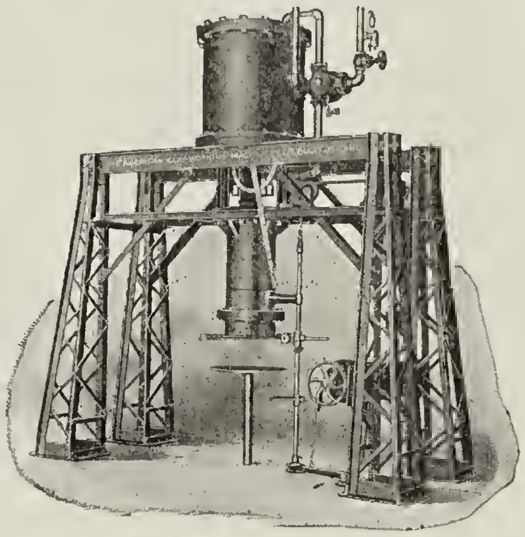

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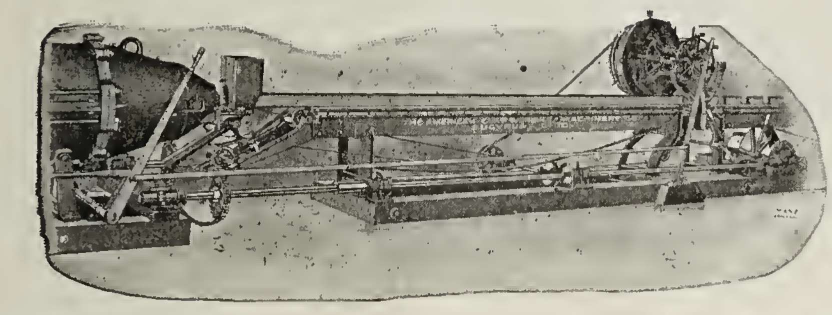

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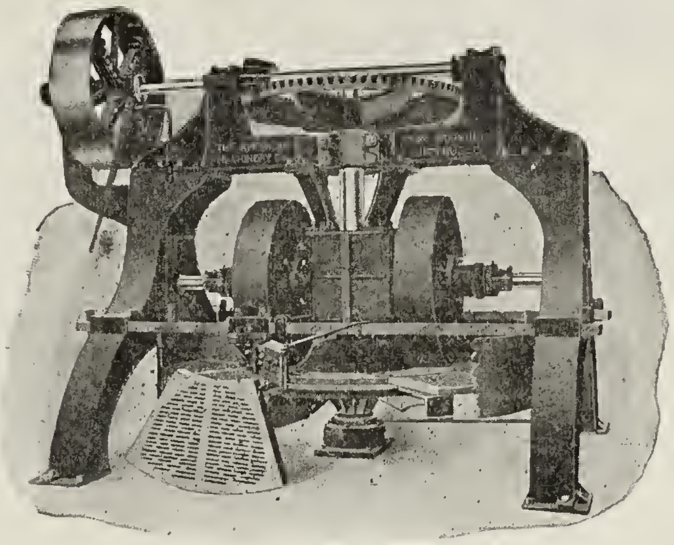

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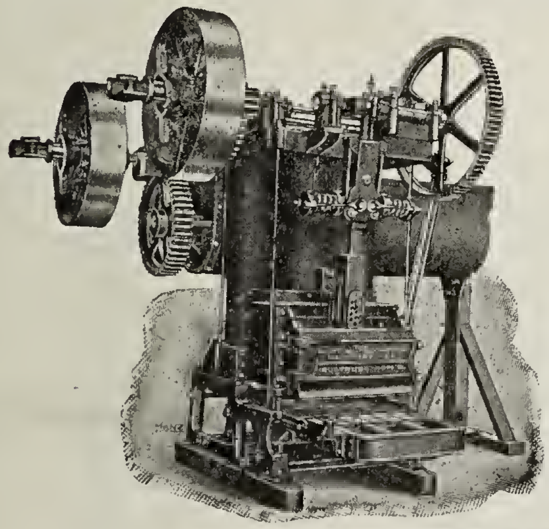

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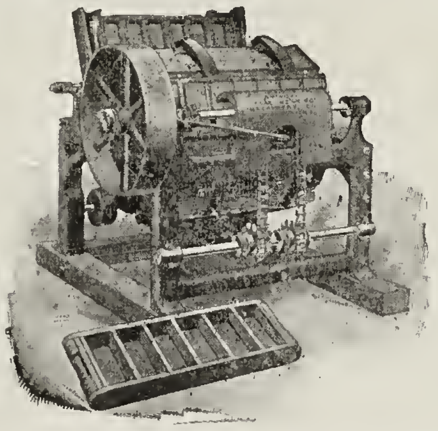

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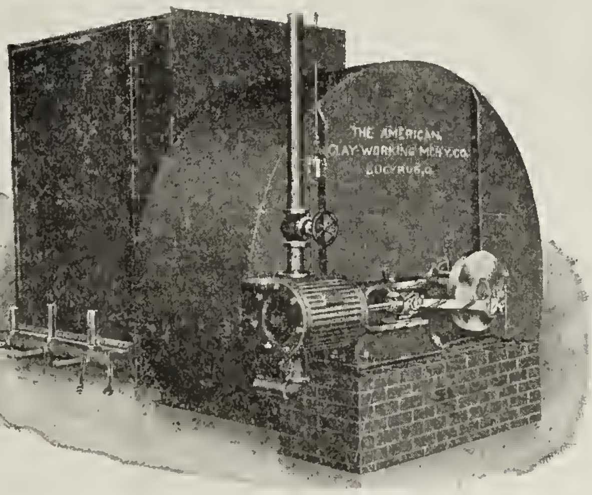
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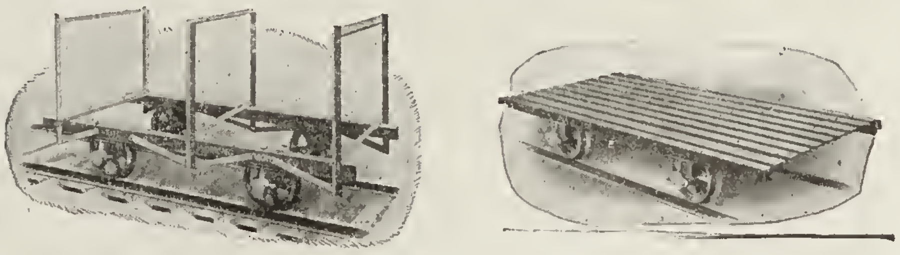

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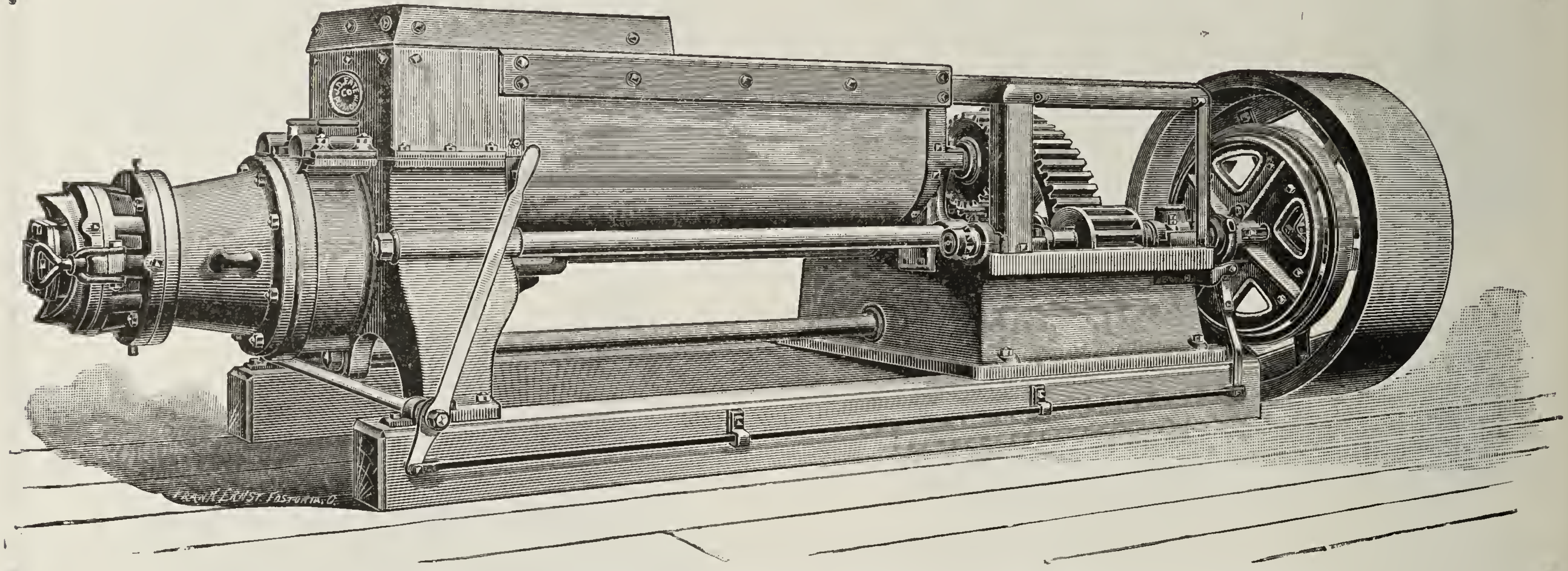
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CLAY RECORD

Vol. XXVI. No. 7. CHICAGO, APRIL 15, 1905. Semi-Monthly, $1.00 per Year
Single Copies, - 10 Cents

THE FORM AND ORIGIN OF CLAYS.*

BY PROF. W. G. MILLER, OF THE BUREAU OF MINES.

Clay is a pretty well known substance. The name itself shows that it originated in Anglo-Saxon times, like the names of men which have been in common use for a great while. We did not import it into the English language, as we have the names of other things which came in in more recent times.

In nature we have what may be called three materials; we have elements and compounds and mixtures; an element, briefly, is a substance which cannot be broken up into anything else; it always remains the same; it does not matter what chemical test you subject it to. One of the most common elements we have is iron. Treat iron in any way and you can not get anything out of it but iron. But here is an iron ore which is a compound because if you treat that in certain ways you will find it contains oxygen as well as iron. A compound differs considerably from a mixture. For instance, I could have in a vessel some oxygen and grains of iron all mixed up; that would not be a compound such as this ore. I wish to refer to those three things briefly. There is another substance here which is a compound composed of iron and sulphur. If you take ordinary sulphur and iron filings and mix them up together they will simply be a compound. You will always find iron and sulphur in this substance combined in different proportions. The terms mineral and rock are often loosely used. They are often so used even in a legal way; we often have great law suits coming up as to what a mineral really is. For instance, a man takes an option on a farmer's land; he buys the mineral right for that land. In some cases after options of that kind have been sold oil has been found on the land. Then the question would come up whether the purchaser would have a right to that oil or not; whether petroleum was really a mineral. So it is of some importance for us to know the difference between mineral and rock. Technically, oil is not a mineral because it is a mixture of different substances; it is not a definite chemical compound. While a mineral is simply a definite chemical compound which occurs in nature, I might make this same compound in the laboratory but it would not be a mineral; it would be an artificial compound. The rock is simply a mixture of minerals. Here is a rock (granite); it is used in monuments and so on. If you look at granite closely you will find it is a mixture of three different minerals. Felspar—and that is the most important mineral in nature to those who are interested in clay, because nearly all clay comes from felspar, and that is the mother of clay. Here is quartz and here is mica. Those compose granite.

I shall now, then, go on to the origin of clay. Felspar is one of the most important minerals in considering the origin of clay; it is a compound of silica, alumina and potash. Silica is represented by ordinary sand. In quartz it occurs by itself, free. In felspar you have silica but it is combined with alumina and potash. Some felspars carry a little lime instead of potash. I have a small piece of white felspar which is a lime felspar. It is a combination of felspar, aluminum and lime. The action of impure waters on felspar produces kaolin or pure clay; and that is the base of all clay. The process of formation from kaolin and from felspar is similar in some respects to the dissolving out of potash from ashes. When you pour water on ashes about the same thing happens, only much more easily than it does in the other case. After being dissolved out of felspar and other rocks and mineral the lime, potash and iron are for the most part re-deposited. In that way originates our deposits of bog iron ore which we have in some parts of Ontario, especially in the older parts. A common name for bog iron ore is limeite. A simple experiment will show how the lime is deposited in some of these swamps. Pour a little quick lime into a tube, dissolve it with water, and after it settles take a glass tube and breathe in there and the carbon dioxide will cause that lime to be precipitated out of the water. That lime which is dissolved out of these felspars is deposited. The bog ore is deposited from lime in that way, but the potash and soda which occur in felspar are not so readily deposited. They go in solution and most of the soda in the course of time gets down to the ocean and that causes the saltiness of the ocean. It is carried by streams and rivers into the lakes and down through the larger streams into the sea and brings about, in course of time, the saltiness of the ocean. In certain waters we get quite a high percentage of these salts. When you get a high percentage of certain salts the waters become medicinal. Our mineral waters, St. Leon water, Buffalo lithia water and these others, the salts which they contain, have at one time been constituents of the rocks and minerals; in many cases they have been constituents of felspar and have leached out of it when kaolin was formed from it. After the soluble materials are taken out of felspar a more or less white substance is left; this is kaolin or pure clay. The decomposition of felspar in nature is never perfect in the production of kaolin. The result is that in nature we don't find kaolin quite so pure as the sample which I show you. Kaolin comes from other minerals as well as felspar. In Canada, and in most other northern countries, we have no such residues, owing to glaciation. In Canada if a rock had weathered down ten or fifteen thousand years ago into kaolin, kaolin would have been lying on the surface. That is what we did have about 15,000 years ago in this northern country, like they have down in the southern states and in South America. About that time when the surface of this country was all covered with these decompositions of products glaciation set in. We don't really known why glaciers came down from the north and swept everything before them on the surface of this northern country, but we have conclusive evidence that this whole country was at one time covered by glaciers which are now represented by our mountains in the north. They swept over this decomposed surface and shoved the kaolin ahead of them, and the result was where we did have comparatively pure kaolin or clay, the material became mixed with sand and iron and alkalies and other materials.

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*Read at the last meeting of the Ontario Clayworkers' Association, held at Waterloo, Ontario.

Up north we have quite a different surface from what we have down in the agricultural districts. Here you have a great thickness of clay and sand. Up north there is no soil in many districts. All this material has been carried southward and deposited here and there; much of this soil or decayed rock material which once covered our Canadian areas has been deposited in the northern states and we see that those states really began to get ahead of us before the time of Adam, before man started, because the glaciers came along and stole our soil and took it down and dumped it across the line. Comparatively pure clay is sometimes found, however, in the northern countries. Certain fissures in the rock are filled with minerals, one of the chief of which is felspar. That is about the only condition under which we get kaolin in the northern country, just in some protected area of that kind. Then in the northern countries we also get pure clay or shale at some distance from the surface, but those areas of pure clay, fire clay and so on are nearly all in coal districts associated with the coal measures. We have not any true clay here in Ontario and never will have any, because our rocks are all too old. Down in Nova Scotia, out in Colorado and in Pennsylvania, wherever they have large coal measures, they have comparatively pure clay. The coal comes from vegetation, from the decomposition of plants and large trees which existed at one time. The reason that these beds of clay or shale are so pure in the coal measures is owing to the fact that in the decomposition of trees certain gases and acids were given off—carbon dioxide and other gases; and these gases with water acted on the clay and dissolved out the impurities. In that way they purified it and thus we get fire clay in coal measures. Frequently the clays which have been pushed southward by the glaciers contained numerous boulders. You are familiar with that kind of clay which does not show any bedding. In other cases in these northern countries we get bedded clays. Those represent the boulder clay which has been worked over by waters which accompanied or came after the glaciers, and they gradually took that clay mechanically and separated it from the boulders and deposited it. Clay is held in suspension for a great length of time in pure water that is not very salty. The clay which is quarried out by fresh water may be taken long distances because it stays so long in suspension before it is deposited. But if you add a little salt in with the clay you will find that clay does not stay nearly so long in suspension. The result of that is that along the ocean where rivers run into the ocean the clay which they carry in suspension is deposited at a comparatively short distance from the shore; whereas, in fresh water lakes and ponds, clay is carried far from shore and deposited in the water. This clay that is carried by that process is distinguished by beds. We have great deposits of that kind in northern Ontario. It is on those clay lands on which the settlers are taking up their homes. There is said to be about 16,000,000 acres of clay land suitable for agriculture in the northern part of Ontario.

We have, then, three classes of clay deposits; we have the clay or kaolin formed in place by the weathering down of rock. We have the boulder clay which has been shoved down by glaciers and dumped in an irregular mass, no bedding at all, carrying boulders. Then, thirdly, we have these bedded clays. You can see the clay deposits are likely to vary much in character from point to point as the conditions in deposition here show. Sometimes the water at special points, like rivers, would have great force and it would carry coarse sand down with it, and you would get that mixed with the clay, and a great many conditions which cause these bedded deposits to vary from point to point. In age these residual clay deposits and boulder clays are, in a geological sense, comparatively much younger than the fire clays formed in coal measures. An example of one of those old clays which is of economic value is that of the Don Valley. That is very much older than any clay which is worked in many parts of the Province. It belongs to what we call the Hudson River formation. The rocks at this stage were laid down before there were any coal deposits. The shale beds at the Don are very old compared with other clays. If the Don Valley shale had had a growth of vegetation over it, it would have been likely fire clay. If a clay is slightly hardened, of course, we use the term shale. If a shale is subjected to a greater hardening process, subject to more pressure and heat, it is turned into slate. From the clayworkers' point of view there is another great difference between clays and slates. You can have a fairly hard shale and if you grind it up it will act like clay, it will have plasticity. But take a slate which has a composition very much like a shale, and grind that up, and it does not have plasticity; it cannot be used for the purposes to which shales can be put. In other words, the combined water had been driven out.

Now I shall refer briefly to some of the physical properties of clay. Some clays with similar chemical composition have totally unlike physical characters. That is a point we must remember. We may have an analysis of two clays which might have almost exactly the same composition but they would not act the same physically. One might make good bricks by a certain process while the other would not. So that in examining clays we have to consider both their physical and chemical properties. Take the substance known as fullers' earth; some of it has a composition similar to certain clays which are used in the clayworking industry, but it has no plasticity and hence could not be used. The more important physical properties of clay include the following: Slaking, plasticity, behavior under heat, shrinkage in drying and burning, color, and tensile strength or ductility.

On burning the clay, if there is over 5 per cent of iron oxide present, the iron gives a red color to the clay. If there is insufficient air the iron will be reduced to a lower state of oxidation, and the color will be bluish black. The same color will be produced where the clay is burned to viscosity, examples of this being bricks which have been melted in the arches of a kiln. Shales with only 2 or 3 per cent iron oxide burn buff, while those with 4 per cent or more burn red. A buff or cream color is also produced if the clay contains much carbonate of lime, say three times as much lime as iron. The percentage of lime in red brick clay is 3.7, while in white brick it is 16½ per cent. The result is the production of red and buff brick. This is from an analysis which I took from clay in Mr. Curtis' brick yard in Peterboro. I also have samples from Mr. Hilliard's brick yard in Renfrew. He had both red and white brick.

Then as to the tensile strength of clay. By this is meant the resistance shown by air-dried briquettes where pulled apart in a testing machine. Expressed in pounds per square inch it varies from 50 to 75 in many brick clays to 200 or more in very plastic pottery clays. It indicates the degree to which the clay particles will hold together and resist tearing in drying or molding.

Now, having run over the physical properties, I shall refer in the same way to the chemical properties. A chemically pure clay would show only three ingredients—silica, alumina and water. Some of the most common impurities in clay are oxide of iron, lime, alkalies, magnesia, boulders and grains of rock. All of these cannot in all cases be called impurities, as at times they give qualities to clay which adapt it to particular uses.

In order of fusibility, if we have much silica under ordinary conditions a clay is more infusible than if we have some other ingredients, such as ferric oxide, magnesia or alkali.

On the question of color, we have the oxide of iron, ferric oxide, this red color and yellowish color. In the one case the iron is more hydrated; in the other case, it is straight ferric oxide.

We have iron oxide, lime, shrinkage, alumina, water, alkali.

This alkali may be in different forms. Sometimes we have grains of felspar through the clay; the potash is combined with silica and alumina. It will act somewhat differently in that case from what it will if in some other compound.

Then there is the efflorescence in bricks; a whitish coating of one per cent of these salts is sufficient to produce an incrustation. This formation may be overcome by adding salt of barium.

Mr. Cornell.—Does that produce the white coating?

Prof. Miller.—Yes; it comes out gradually. Sometimes there is only 1-10th of 1 per cent present, but that is sufficient to affect it.

In cases where there is 1-10th of 1 percent of sulphate of lime present, it will cost 32 cents per 1,000 bricks to use the barium chloride to counteract that.

Iron oxide produces fusibility. Iron may be present in many minerals. We may have it present in iron pyrites or, as it is often called, fool's gold. This sulphur goes to form these efflorescences which I have spoken of when it is heated. That is a bad thing for that reason. If the iron is in this form, ferric oxide, it does not necessarily produce any bad effects; or, it may be present in bog iron ore form.

It is said that a pottery clay should at least have four or five per cent of iron oxide to produce a good red color in burning. A large excess of iron oxide tends to blistering in burning. Any clay used for making china or white ware should not have iron.

Lime occurs in most cases as a carbonate. In order to test a clay for lime carbonate we simply add a little acid or vinegar. The most common kind of acid to use is hydrochloric.

The President.—What effect would sulphuric acid have?

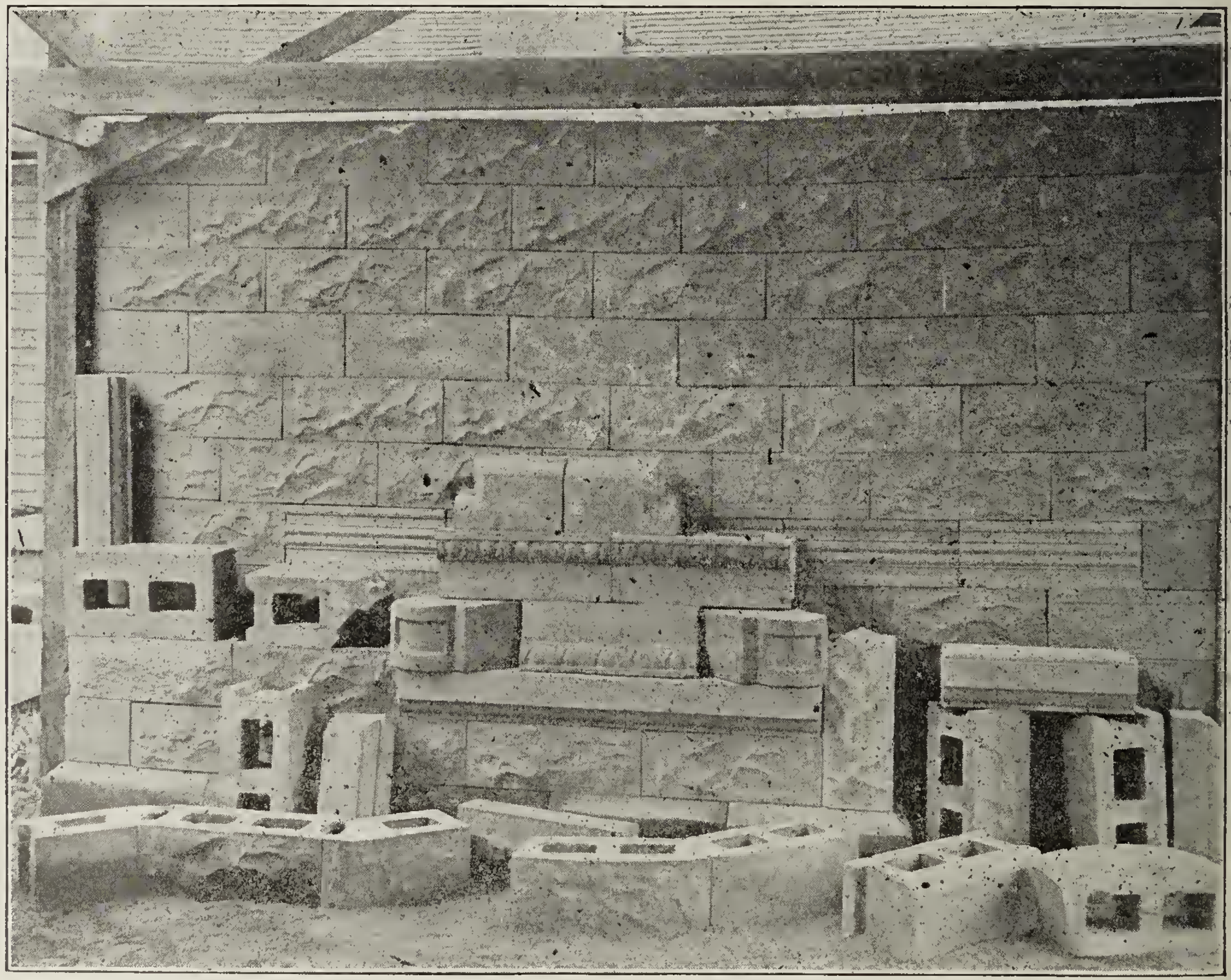
Prof. Miller.—Just the same effect.

I have run over hurriedly the main points which I wished to bring out. I might say I am very glad to have the opportunity of taking up some of those points, even in this rough and ready way. The Bureau of Mines would like to see any of you when you come to Toronto. If any of you are interested in our reports, write down and we will send you copies of them. You will find a little information once in a while on clays.

We are very anxious to get the names of all the clayworkers in the Province. We have always found it difficult to get in touch with them, and we hope to get all the names of those present from the secretary, and we would like to work in conjunction with you as much as possible. And I hope that you will stick together and work for the clay school in this Province, as has been suggested this afternoon.

A PROFITABLE HOLLOW BLOCK MACHINE.

Cement Stone Plant, Pettyjohn Bros., Terre Haute, Ind.



Cement Stone Blocks, Manufactured with Pettyjohn Portable Machine.

The practical utility of the hollow concrete building blocks as they are formed of varying sizes, shapes and ornamentation to meet the demands of building construction, have been recognized by leading architects and contractors of experience as the most desirable material for the walls of buildings of present day construction. They have come to permanently remain, and it may be expected that coming generations will employ them exclusively in building construction, if for no other reason than from a sanitary point of view. Cumbersome expensive machinery increased the cost of production in the early introduction of this class of building material to a prohibited point of universal use, but since the introduction of the Pettyjohn's hollow concrete block machine, fully illustrated herewith, manufactured by Pettyjohn Bros., of Terre Haute, Ind., a practical machine that will turn out a large number of hamdsome, stronger and better blocks than most machines on the market at a very low cost of production, is a long step in advance in the solution of the question of cheap material for substantial building construction. This machine is too simple to get out of order, too strong to break and so cheap that every builder or brickmaker can afford to own one, thus opening a profitable field for the brickmaker to run a hollow concrete building block plant in connection with his brick business. The capital required for a successful equipment is small compared with the returns, and can be readily expanded as business justifies. The advantages of the machine illustrated are that the blocks do not have to be carried away from the machine, but are left where they are made until sold. You simply move the machine to another spot. It has no heavy and expensive iron pallets; any carpenter can make them after seeing a sample. The blocks are made on the floor instead of several feet above it, making it easier to mix and tamp. There are no springs, levers, cogs, or gears to get out of place. Changes of the face design can be made in a few minutes, and any ordinary workman can work it after being shown how. In operating the machine you set it on a pallet. The mixture is shoveled into it, waste being prevented by the hopper. The concrete is then tamped by hand with a tamping rod until the mold box is full and solid. The finishing of the top is done with a cast tamping plate in the shape of the top of the stone. Before the tamping plate is removed the cores are withdrawn and placed on the next pallet. The cores are provided with guides so that they will go to their exact places. As the cores are placed the handles on top are given a slight twist which locks them securely to the pallet. The machine is then lifted off the finished stone, the sides falling apart automatically, and as it is placed on the next pallet the sides go to place again. Rock faced or such other ornamental designs as may be desired are produced by means of cast plates put against the sides or ends of the mold box, and require no thumb nuts or the like to hold them in place, so that changes may be made instantly. All of the rock face designs are taken from natural cut stones and produce blocks that are very handsome in appearance. At a small additional expense the blocks may be molded two inches larger than they are to be in the finished wall. After the stones have partially set this extra two inches is rocked off with a stone cutter's pitching tool, making every block different, and presenting an effect in the wall that is strikingly artistic. For churches, store fronts and handsome residences there is nothing that will equal it. By using different colored sands, crushed white lime stone, crushed granite or quartz, almost any natural stone may be duplicated so as to deceive even the experienced. By using different mineral colors the stones may be made of almost any color, either solid, mottled or stratified. The cost to make the standard size blocks varies slightly with local conditions, but is usually about eight cents each, itemized as follows: Three yards of sand and gravel at fifty cents, $1.50; three barrels of Portland cement at $1.60, $4.80; two laborers one day at $1.50, $3.00, and water and sundries, say thirty cents; total, $9.60, divided by 120, the number of blocks the above will produce, gives a cost of eight cents per block. Where blocks are made in quantities large enough to justify the employment of a concrete mixer the cost will be considerably reduced. One and one-half cents each will defray expense of delivering blocks by team. Usual selling price is from eighteen to twenty cents each. Frequently they are made on the premises from the sand taken from the cellar and then used in the walls of the building, thus saving hauling the sand away as well as delivery of the blocks. This machine being so easily portable makes this practice thoroughly practical.

◆

THE C. O. BARTLETT & SNOW CO. BURNED OUT.

The C. O. Bartlett & Snow Co., Cleveland, Ohio, met with a severe loss by fire on the 11th of April. The fire broke out about 12:30 a. m. and almost immediately spread throughout the main buildings. Thirteen fire engines and two fire boats responded to the call.

The main buildings were badly damaged. The office buildings were not much damaged and the boiler and engine were not badly injured. The greatest loss was in patterns. The largest part of the machinery was not seriously injured.

They have immediately commenced to get the buildings in shape and expect to start up in the machine shop department next week and in the boiler shop within two weeks. The Ohio Ceramic Eng. Co., the McMyler Mfg. Co., the Bowler Foundry Co. and the Cleveland Gas Light & Coke Co., and others have kindly offered the free use of some of their tools, therefore they will be able to complete the contracts and fill the orders with little delay.

LEGISLATIVE COMMITTEE OF THE ILLINOIS CLAYWORKERS' ASSOCIATION.

TO THE CLAY WORKERS OF THE STATE:

At the annual convention of the Illinois Clay Workers' Association held at Champaign in January, the following resolutions were unanimously adopted:

"Resolved, that the Clay Workers' Association of the State of Illinois hereby earnestly request the Legislature to make appropriations to the University of Illinois which will enable it to make such additions to its teaching force and equipment as are necessary for thorough and practical instruction in the geology of clay deposits, their origin, classification, physical and chemical properties, and their behavior under such influences and conditions as are met with during the processes of manufacture. This association also requests that additional appropriations be made which will enable said University of Illinois to organize and equip a laboratory, and vigorously prosecute in connection therewith, such investigations of field and laboratory problems as will be helpful to clay workers at large, and make such collections of materials and products as will be useful to them, and also to publish the results of these researches in such form as will make them available to all interested.

"Resolved, that the Clay Workers of Illinois earnestly request all tax-payers connected with agricultural and engineering operations, railroads, building trades, or the manufacture, sale or use of structural materials, to join us in this petition to the General Assembly."

Also a committee of six appointed to do what might be necessary to secure this appropriation from the State.

At this convention, $300 was donated for this purpose by three manufacturers, all of whom are members of this committee. The committee after numerous conferences, had a bill introduced in the Senate by Mr. Barr of Joliet, which provides for an appropriation of $10,000 a year for two years; half of which is to be spent for instruction purposes and half for the equipment and maintenance of a laboratory. This bill, known as Senate Bill No. 340, was reported out of the Geological committee of the Senate unanimously, with a few unimportant amendments, and is now before the Senate Appropriation Committee, consisting of Gardner, chairman; Hughes, McKenzie, Townsend, Pemberton, Mueller, Juul, Barr, Hamilton, Lundberg, Evans, Hall, Curtis, Templeton, Campbell, Hull, Powers, Burton, Cunningham, and before whom we have had a hearing.

The policy of the 44th General Assembly is to keep all appropriation bills in the committee until all have been introduced, then take action upon them. The committee is fully convinced that if we can get this bill reported favorably out of the Senate Appropriation Committee, that the hardest part of the struggle will be over and the object of this letter is to ask your assistance both there and in the House of Representatives.

We believe we have sufficient money to defray all expenses and are not asking for any pecuniary assistance, but we need your personal influence with your senator and representative from your district, or from any other with whom you are acquainted.

We wish to earnestly request that you personally interview your representatives in both Houses of the Legislature if at all possible, but failing in that, that you mail to them individually a copy of the enclosed letter, after addressing and signing, or that you write them a personal letter asking them to support this measure.

If this bill, known as Senate Bill No. 340, becomes a law, the University of Illinois will have a Department of Ceramics similar to the Ohio State University and the University pledges itself to the committee to undertake the solution of such problems as will be of practical benefit to every clay worker in the world, just as their experiments in agriculture have been of inestimable benefit to every farmer in the world. We request that you put your shoulder to the wheel in a whole-hearted way and help us push this bill through. We need every ounce of assistance we can get and wish those of you, who are acquainted with the members of the Appropriation Committee mentioned above, would make it a particular point to see them or write them a personal letter upon the subject. Again asking, as Clay Workers for the good of the craft, for the good of the State, and for your own individual good, your earnest help in this matter, we are, Yours very truly,

LEGISLATIVE COMMITTEE OF ILLINOIS
CLAY WORKERS' ASSOCIATION.
WM. HAMMERSCHMITT, Lombard,
JOHN W. STIPES, Champaign,
A. L. CONVERSE, Springfield,
D. V. PURINGTON, Chicago,
WALTER COLLYER, Albion,
F. W. BUTTERWORTH, Chairman, Danville.

LETTER TO WRITE TO YOUR REPRESENTATIVES.

DEAR SIR:

There has been introduced in the Senate by Mr. Barr, Bill No. 340, providing for an appropriation of $10,000 a year for two years to be used by the University of Illinois, $5,000 for instruction in clay working and $5,000 for the equipment and maintenance of a laboratory with which to demonstrate the practical values of the clays of Illinois and to investigate such problems as may be of practical value to the clay workers of the State and to publish the results of these investigations.

The clay industry of Illinois comprises those manufacturing establishments making brick of all descriptions, paving brick, fire brick, sewer pipe, drain tile, crockery, roofing tile, china ware, pottery, terra cotta, cements and various other articles both decorative and useful. It is estimated that there is at least $20,000,000 invested in 750 plants, working 17,000 men. Up to 1890 it was a very crude industry in nearly all of its branches. About that time it was discovered that in the older geological formations, there were clays of great value, and the entire process of manufacture was changed to suit the different characters of the raw material employed. Because the clays of the older formations are almost always of great thickness, the general character of the industry was greatly changed. The vast amount of the accessible raw material encouraged the building of large plants, equipped with very expensive machinery and appliances, representing large investments of capital, and the modern ceramic plant of today is a manufacturing establishment second to none in our State.

For the management of these plants, it requires a clay worker having a more or less thorough knowledge of geology, chemistry and mechanical engineering, but above all else, it requires a man who has been especially educated, either by practical experience at the plant or by a course in some college of ceramics; or, better yet, by both. These men have not been developed nearly so rapidly as the plants themselves. It is commonly said that clays vary in their nature and characteristics as greatly as the men who walk over them.

If educated only at the works, the young man is a ceramic engineer of but one particular kind of clay. If educated in the University in a well-equipped laboratory, he has the ground work of all the various varieties and is ready for the finishing touches of practical experience. It is for these reasons that we feel the need of special education of our young men along these lines to fit them for the management of plants and also to fit them to develop to the best advantage, the clays of the State.

The clay resources of the State of Illinois have been almost criminally neglected in the past. When a modern clay man is looking for a factory location, the first thing he does is to get all the information obtainable from the geological reports. When he comes to Illinois as a possibility, because of their absence, he cannot help but think the reason of there not being any reports is that there is nothing to report on. It is impossible to demonstrate the commercial value of a clay either by a chemical analysis or a simple physical examination. No man, no matter how expert, can form any intelligent idea as to the value of a clay until he has absolutely tried it in a more or less practical way. A clay that is of no value if worked by one process, very probably would be of inestimable valued if worked by a different one. Again, because of the rapid advancement in clay working in the past fifteen years, there are problems coming up continually that an individual plant cannot possibly solve; or, if it did solve, would not publish. It is for the purpose of practically demonstrating the commercial value of the clay deposits of our State and for the purpose of solving difficult problems met with in working the clays of the State, and for the purpose of publishing this information, that we ask for an appropriation for the proper equipment of a Clay Laboratory at the University of Illinois, to be used in connection with the appropriation for instruction purposes.

We, as clay workers of the State of Illinois, are not asking you to do anything unprecedented. We are not asking you to even put Illinois ahead of the adjoining states. We are only pleading with you to make your State equal. Ohio has a very excellent Department of Ceramics at the University, with full and complete geological reports, supplemented by reports from the clay laboratory, commercially demonstrating the value of the various kinds of clay found in the State. This department has done a world of good, both to the clay workers at large and in the development of the natural resources of Ohio. New Jersey, and, I believe, New York, have seen the need of departments of this sort and have established them at their State Universities.

We ask these appropriations for the good of the industry at large; not for any individual benefit. The various plants are heavy tax-payers and are large employers of labor. We ask for these things because we need them and need them badly, just as badly as the farmer or the engineer. We ask them secondly, for the good of the State, because we have reasons to believe that Illinois is as rich in clays as any other State, and because we want people interested to know of it.

For the foregoing reasons we wish to earnestly request you to support this measure, both in Committee and on the floor of the Legislature. Yours truly,

(Sign your name) ————

COST OF MAKING SAND LIME-BRICK.

No feature of sand-lime brick manufacture is of such vital interest today in this country as the cost of production. How cheaply can these brick be made? This question is being asked, not only by those who are proposing investment in the manufacture of sand-lime brick, but also by those who are making the clay brick with which the sand-lime brick must come into competition. I have seen no answer to this question by anyone in this country who is exclusively engaged in the manufacture of sand-lime brick. The cost estimates are made for us by theorists, promoters, or those who are in some way interested in the establishment of sand-lime brick plants. It is true the sand-lime brick business is too young in this country to furnish reliable data of operating results, even were anyone able or disposed to furnish the records of his experience in this line. Hence the following article, which appeared in a recent number of the *Tonindustrie-Zeitung,* will be of interest to many:

"When in the years 1899 and 1900 the first sand-lime brick works were put in operation there was of course lacking the experience necessary to erect a sand-lime brick plant suitable for the business and to properly manage it. These experiences must first be collected and have cost very much money to those who first placed their confidence in the promises of the inventor; in fact, many an establishment even went to the ground in consequence of this cost of learning the business. It appears evident that on account of the cost resulting from unforeseen conditions the cost of production was increased, and it repeatedly happened that the cost of manufacture was higher than the attainable selling price. The following operating results which have to do with the actual production price of 1,000 lime-sand brick, in so far as cost of labor, lime and coal come into question, call attention to these times. The results are from records of a factory with a yearly capacity of 3,500,000 brick, of which the production, in consequence of poor building activity, amounted to not more than 1,500,000 to 2,000,000 of sand-lime brick yearly, as shown in detail in Table 1.

Table 1.

YEAR.	1899–1900.	1901	1902	1903	1904
Yearly production....	1,792,000	1,529,000	1,657,000	1,996,000	1,746,000
Daily labor bills	9.90	8.48	8.07	*8.39	8.33
Lime for 1,000 brick...	.83	1.00	.90	.84	.83
Coal for 1,000 brick....	.82	.84	.58	.55	.49
Labor cost per 1,000 brick	1.79	1.19	.99	.97	.80
Total cost of 1,000 brick	3.44	3.03	2.48	2.36	2.12

* Including Foreman's pay.

! Attention is called to the fact that the plant was only making from 5.35 to 10,425 brick per day.—Editor.

In this table are seen the actual cost for 1,000 sand-lime brick and the proportionate amount falling upon lime, coal and labor, as also the amount of the daily labor bill. In the pay of workmen are included, besides the contributions for illness and disability insurance, the cost of getting the sand and, after the employment of a foreman, since the beginning of 1903, also his salary with this.

Table 2 gives the price of lime and coal and the amount of each necessary for 1,000 sand-lime brick. In connection with this it is to be observed that since 1903 one-third Saxony brown coal, of which a hectoliter with mine moisture weighs about 70 kilograms, and two-thirds Lower Silesia coal were fired, while in the previous years coal was used exclusively.

Table 2.

	COAL.			LIME.			
Year	Price per ton.	Price per 1,000 brick.	Pounds per 1,000 brick.	Price per bbl.	Price per 1,000 brick.	Pounds per 1,000 brick.	Percent age in brick.
1899 1900	$2.74	$ .82	$6.22	$ .37	$ .83	$5.13	$6.66
1901	2.82	.84	5.97	.40	1.00	5.84	7.58
1902	2.72	.58	4.49	.39	.90	5.39	7.00
1903	2.27 .90	5.52	4.05 2 02	.... .36	.... .84	.. 5.20	.... 6.74
1904	2.32 .90	.... 4.92	3.53 1.76	.... .57	.... .83	.... 5 07	.... 6.57

1. Brown coal. 2. Price for the mixed coal, ⅔ bituminous coal and 1-3 brown coal.

The reduction of the production cost from $3.44 to $2.12 was brought about by different causes.

In the first years of operation interruptions were no rarity and since in consequence the workmen could not always be employed to their capacity, the pay was for this reason high in proportion to the actual work performed. Moreover, there came the additional cost for improvements, new equipments, etc., which required in the beginning an important amount also. By the installation of a good press of positive capacity it resulted that an increased daily production permitted of a better utilization of the working force. The employment of a foreman, who is a licensed fireman and a machinist, had the farther economy as a result in so far as all the preceding improvements were carried out and also that the sheet metal for the mold liners were made ready. Moreover, it was deliberately sought to economize in every place where it is customary and therefore there was also recourse to firing of a mixed coal. As soon as the sand conditions were more favorable and the grinding of one-third of the sand—gravel—upon a ball mill was abandoned, the labor bills were still farther decreased and likewise by the improvement of other conditions the cost was made about 8 to 10 cents cheaper.

This very instructive example can also serve as proof that even small plants can be operated proportionately cheap, if the work is undertaken with precaution, economy managed and poor equipment replaced with new, that is better adapted to the work."

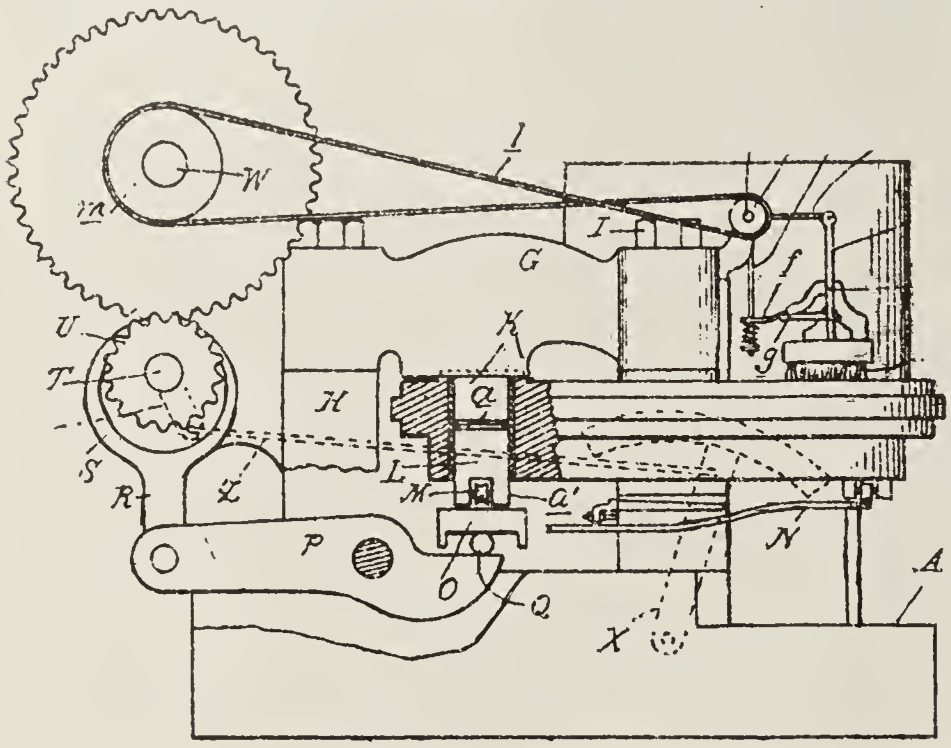
The cost tables have been expressed in U. S. units, but no correction has been made for the difference in price of labor in Germany and the United States. A safe factor to use to adapt the labor cost to our condition is 3. Making this correction in the tables we have the total cost of making sand-lime brick at this German factory in 1904 $3.72, coal costing $1.85 per ton and lime costing 37 cents per barrel. This cost does not include anything for sand except the cost of loading it and bringing it to the factory. Nor is there included anything for depreciation nor for office expenses.

W. D. Richardson.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

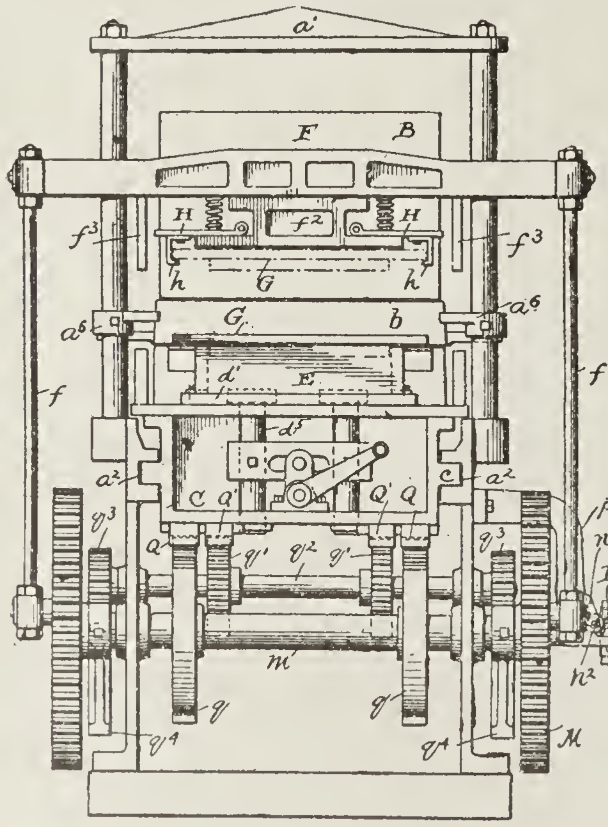
These new inventions are those that are especially of interest to any one engaged in the line of building materials and their manufacture, or machinery to make them.

784,470. Brick-Press. Edgar D. Church, Saginaw, Mich., assignor to The American Sandstone Brick Machinery Co., Saginaw, Mich., a Corporation of Michigan. Filed Mar. 1, 1904. Serial No. 196,087.



Claim.—1. In a brick-machine the combination with a rotary table having mold-cavities therein, of an elongated work member having a bearing-plate intermediate at its ends, plungers arranged for vertical reciprocation within said cavities, and means for depositing plastic material in said cavities to be compressed by said plungers against said bearing-plate, of means for cleaning the ends of said plungers comprising a brush and mechanism for moving the same over the surface of the plungers while in registration therewith.

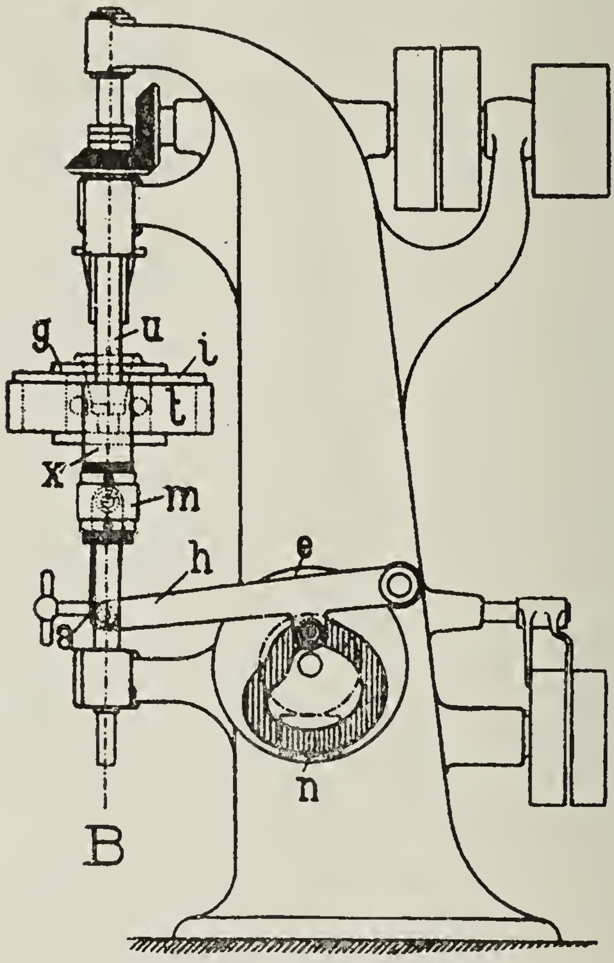
784,535. Molding-Machine. Harriet A. Battenfeld, Cleveland, Ohio, assignor to The Berkshire Manufacturing Company, Cleveland, Ohio, a Corporation of Ohio. Filed Nov. 9, 1903. Serial No. 180,342.



Claim.—In a molding-machine, the combination with a reciprocating bed adapted to carry a flask, of a flask, a hopper, pressing mechanism, means whereby the flask on said bed may be automatically filled from said hopper, may be operated upon by said pressing mechanism and may be moved out of range thereof, and means carried by said bed for closing the opening in said hopper.

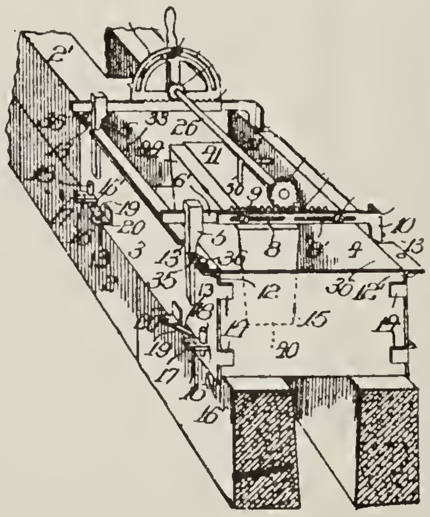
In a molding-machine, the combination with the frame, of a reciprocating bed having a plate thereon, a flask secured upon said plate, a hopper arranged to deliver molding-sand to said flask, means for closing the opening in said hopper when the flask is not under the same, a press, a presser-board carried by said press, means whereby said presser-board is left in the flask, and means for moving said bed to said hopper to said press and out of range with the same.

784,059. Pottery-Molding Machine. Louis Mary, Fegersheim, Germany. Filed July 29, 1904. Serial No. 218,671.



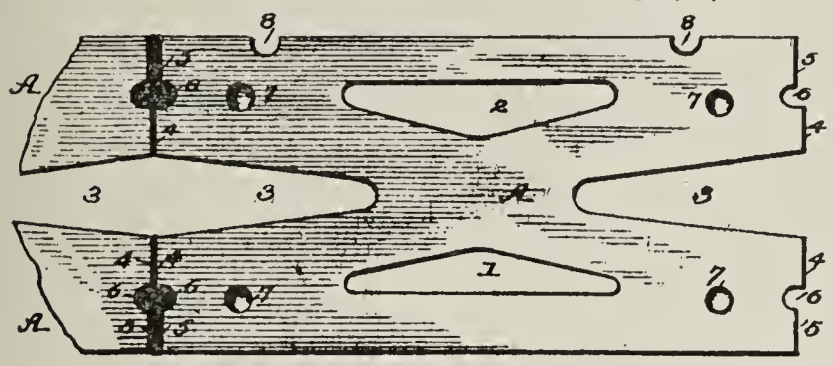
Claim.—In a pottery-molding machine, the combination with a rotary core and vertically-reciprocating flask-carrying frame, of disconnected flask-sections held by the frame and adapted to move in horizontal lines toward and from each other, springs for moving the sections entirely away from each other, and automatically-operated means for raising the sections and pressing them together during their ascending movement, substantially as set forth.

784,690. Adjustable Molding-Machine. Israel L. Landis, Chicago, Ill. Filed Dec. 19, 1904. Serial No. 237,484.



Claim.—In a molding-machine, two series of mold-board supports, one series movable relatively to the other series, spaced-apart mold-boards normally secured at their upper edges to said supports, means for adjusting said mold-boards toward and from each other and relatively to said supports, means for moving one series of supports relatively and parallel to the other series of supports, and means for yoking together the lower portions of said mold-boards against angular spreading movement.

785,539. Building-Block. Elwood E. Benner, Sargent, Nebr. Filed Nov. 7, 1904. Serial No. 231,767.

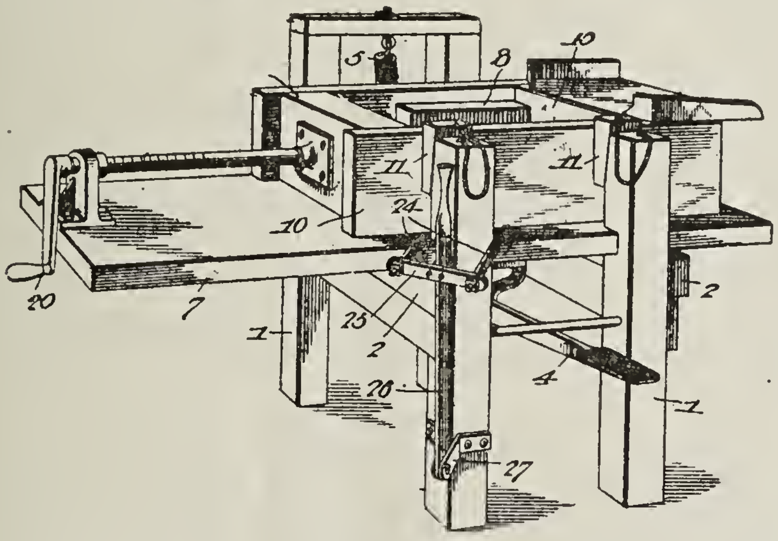


Claim.—The improved building-block having a substantially rectangular form and provided at its ends with an open air-space and on opposite sides thereof with vertical grooves, the portion exterior to the grooves being cut away or made shorter than the portion which intervenes said grooves and the end air-space, as described.

A wall composed of a series of blocks having a substantially rectangular form and provided with body air-spaces 1, 2 and end air-spaces 3, the block being laid one directly upon the other so that the several openings coincide and form so many vertical air chambers or passages extending through an entire wall, the end spaces 3 coinciding and forming a double air-space, and a mortar-lock applied at the ends of the blocks in the manner described.

785,272. Machine for Molding Hollow Cement Blocks. Hezekiah A. Robbins, Bedford, Iowa. Filed May 19, 1904. Serial No. 208,738.

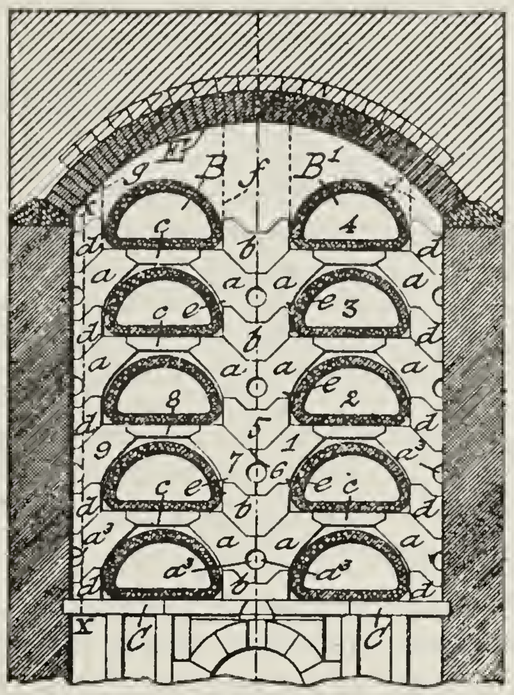
Claim.—In a machine for molding hollow concrete blocks, a mold having a rigid side wall and a rigid end wall and provided with movable side and end walls, a movable bottom plate, means for moving the bottom plate outwardly from the mold, and devices for guiding such means in a direction diagonal of said mold.



In a machine for forming hollow concrete blocks, the combination with a frame including a pair of rear uprights, and a pair of front uprights, the latter being provided with inclined or beveled inner faces, a stationary table having a core-receiving opening, a core, a treadle connected to the core, a spring tending normally to elevate the treadle, a back plate detachably secured to the rear pair of uprights, a detachable front plate, wedges for insertion between said plate and the inclined walls of the front pair of uprights, a stationary end block detachably secured to the table, a movable end block, a screw having swiveled connection with said movable end block, and a bracket having a threaded opening for the passage of said screw.

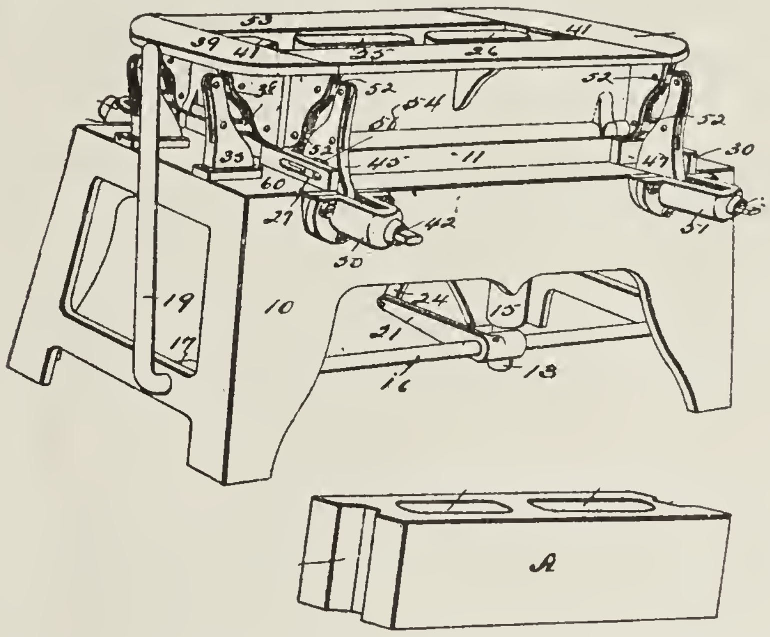
785,268. Gas-Furnace-Retort Setting. Glenn H. Niles, New York, N. Y. Filed Apr. 4, 1904. Serial No. 201,491.

Claim.—A setting for retorts, comprising column-sustaining and individual-retort-supporting wing-blocks constructed and adapted to be individually removed without destroying the integrity of the column and co-operating binder-blocks.



A setting for retorts, comprising column-sustaining and individual-retort-supporting wing-blocks constructed and adapted to be individually removed without destroying the integrity of the column, provided at their lower portions with projections, keys between the upper ends of said wing-blocks, and binder-blocks receiving the projections of the wing-blocks.

785,093. Artificial-Stone Mold. William C. Fox, Waterloo, Iowa, assignor to Iowa Gasoline Engine Company, Waterloo, Iowa, a Corporation of Iowa. Filed July 18, 1904. Serial No. 217,144.



Claim.—The combination of a bed, cores mounted thereon, a lifting-frame normally resting on said bed and surrounding said cores, guide-arms on said lifting-frame, lever mechanism whereby said frame may be lifted, end plates and side plates of a mold normally resting on said guide-arms of the lifting-frame and pivotally supported from the bed, and means whereby the lifting of the frame raises the end plates and side plates through arcs.

◆

W. C. Mitchell, Edwardsville, Ill., is not slow in the waste heat dryer or kiln business. He is a practical man and knows what he is talking about. Consult him when in trouble or when you wish to enlarge your plant.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,
Ninth Floor, Plymouth Building,
303 Dearborn Street,
CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.

Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVI. APRIL 15, 1905. No. 7

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

But the more a man boasts of his honesty the more he doesn't prove it.

The three greatest words in the English language: "Enclosed find check."

Speak today what you think is true, and contradict it all tomorrow if necessary.

Experience is a great teacher, but some men are conceited enough to think they can give experience a few pointers.

Never argue with a man who disagrees with you. Congratulate yourself because of your superior wisdom and let it go at that.

THE CLAY RECORD is the only semi-monthly clay journal published and gives more to its readers and advertisers than all other American clay papers combined. Subscribe now; advertise now.

The season's business has opened out most favorably, and it does not appear that it will go out less so, unless an extraordinary event should appear and check the prosperous season now with us.

We may have been deceived in making observations, although doubting it, yet the facts compel us to say that we do not recall a prior experience in this nation where so large a percentage, and so liberally, of the people enjoyed a similar prosperous period.

That the affairs of the people are in good shape there is no question, and the people may be depended on to keep things in line for some time to come. The sturdy accumulations of the masses hold together, making the bulk which is either the making or unmaking of the nation, and we believe as the mass has turned over one or more times recently, and turning even now, adding to its bulk, we are justified in pinning our faith in, and our dollars on, this country's prosperity.

It is sometimes contended that we, as a nation, a people, are not advancing excepting in those directions which go to the unmaking of the race. How one looks at this question will depend on one's view, whether large or small.

From our viewpoint we have advanced many degrees in the way of improvements in and around the *"brick yard."* One thing especially has impressed use—the use of electric motors in driving the various machines. Some time ago, in these columns, we ventured a suggestion along these lines, the idea impressing us that it would be an advance in pre-existing methods; would allow considerable shrinkage in shafting, hangers, pulleys and belts, etc., and the change has come, we suppose, when conditions were ripe to meet the demand. Its coming is welcomed, and the method we urge upon our friends where it is possible, to adopt, for reasons with which one and all are familiar.

For many, many years the brick yard was of the earth, earthy, and it looked it, and the dealings therein kept mighty close to it, but a glance at many yards today reveals the application of standard machinery and modern driven types; in other words, skill and science are planning and equipping the modern yard, and you will not run amuck following the lead of the "ads" in THE CLAY RECORD.

"All men are liars," the Good Book says, and it must be true, but it does not say "All men are knockers," and of this we are glad, although we know that to make up a "knocker" your man must be a liar. It must be that there are degrees in lying from the innocent to the infamous degree, yet we are confident a man has to be an infamous liar before he can blossom out into a knocker.

It is almost certain the number of these "imps of Hades" is growing rapidly, and the driver of the "goose quill" or steel pen, sometimes called editor, is the contributor-in-chief to the growth of these imps. He is so full of prejudices, hence all-wise, thinks that he controls the ignoramuses, and would if he could, and where truth is against him he, the infamous liar, straightway becomes a knocker. We could support this allegation by several illustrations, but at this time one will suffice, reserving others for future use. Certain interests have prospered (but it so happens these are outside the influence of this particular editorial sanctum sanctorium), after years of struggle, and now surely grounded; but it so happens certain interests have waned where the aforesaid editorial influence controls, and being frenzied at the "prosperity of the first named interests, proceeds to knock the latter by his editorials, the latter being a tissue of lies of the most infamous character for, as we have said, it takes an infamous liar to make a knocker.

FIRE! FIRE!! FIRE!!!

The Emerson (Neb.) Brick Works burned to the ground. Loss, $6,000; insurance, $2,000. The plant was owned by C. C. Boudreau & Sons.

A fire of unknown origin started in the brick yard of M. P. Street, north of St. Clair Ave., Columbus, Ohio, and resulted in quite a loss to the buildings and kilns.

Fire broke out in the Jackson-Phillips Brick Co.'s plant at Brick Haven, Va., and damaged it to the extent of $3,000. No insurance was carried on that part of the property.

The Bradford (Pa.) Terra Cotta Co.'s works at Lewis Run were completely destroyed by fire. The loss is estimated at $50,000, with but small insurance. It is thought that the plant will not be rebuilt at Lewis Run, but at Bradford.

LULL IN INDIANAPOLIS BRICK TRADE.

There is a lull in the business of the Indianapolis dealers in brick that was entirely unlooked for and that the trade is hoping will be only temporary. Early in the season and before actual work in building lines had been started to any extent, manufacturers in brick anticipated an unprecedented demand and pushed their factories to their capacity, rushing the product to this market as fast as transportation facilities would permit. The demand opened up strong and there was a good early trade. In the meantime the local yards have been filled and stocks are large. The demand in the last ten days has been extremely small. Dealers say this is due largely to the quantity of old brick on the market from the recent fire in the wholesale district. It is estimated that this surplus will not be cleaned up for a least thirty days.

Prices are the same as a year ago. Early in the season the local brick dealers got together and charged an advance of 15 cents a thousand, which was discounted on all bills settled under thirty days. Dealers say this was necessary to enforce more prompt payment, as the brick dealers were furnishing some contractors with a large part of their capital by waiting until after jobs were completed before getting payment for their brick. Collections have improved, they say, and the advance has been taken off.

OBITUARY.

Conrad Black, 76 years old, a pioneer brick maker of New Jersey, died at his home in Paterson. He started business at Little Ferry.

Cassius C. Thompson, president of the pottery company bearing his name, and who was very prominent at East Liverpool, Ohio, dropped dead in his office.

Harrison H. Holland, proprietor of the Holland brick factory, south of Moline, Ill., died suddenly of heart disease. He was 64 years old, and lived in Rock Island 36 years.

Robert Davis, for 35 years with the Adams Brick Co., of Indianapolis, with plant at Martinsville, Ind., committed suicide by taking carbolic acid. He drank the poison in the office, then walked home and died.

Jacob Miller, Sr., died at his home on Island Ave., near Brighton Rd., Allegheny, Pa. He was a brick manufacturer until two years ago, when he retired on account of ill-health. Since then the business has been conducted by his sons.

ANOTHER COMPANY READY FOR BUSINESS.

The Hocking Valley Fire Clay Co. have just completed and equipped their large fire clay mines, in the Hocking Valley District at Nelsonville, O. This company owns several hundred acres of valuable fire clay and coal lands, and their fire clay supply is beyond estimate.

The Hocking Valley fire clays have become famous for the manufacture of paving brick, sewer pipe, terra cotta, fire proofing and building brick; it also makes excellent clay for use in encaustic tile and for the body in pottery wares.

The mining and shipping facilities of the company are unexcelled and they kindly solicit the correspondence of all clay manufacturing concerns who require a high grade fire clay.

The company are also installing a plant of large capacity for the milling and screening of the clays; the officers are F. A. Freer, President, and C. E. Jewett, Secretary and Treasurer.

In addition Mr. F. A. Freer has purchased the former plant of the Bates Brick Mfg Co. and will manufacture fine building brick.

LOWEST RATES EAST

are afforded via the Nickel Plate Road. With solid through trains to New York City and intermediate points, via both Lackawanna and West Shore Roads, and to Boston and other New England points, via the Nickel Plate and West Shore and Boston & Maine Roads, travelers via that popular low rate line are offered all modern conveniences. Excellent dining car service, meals being served in Nickel Plate dining cars on American Club Meal Plan, ranging in price from 35c to $1.00. No excess fare charged on any train on the Nickel Plate Road. Chicago depot, Van Buren and La Salle Sts., the only railroad station in Chicago on the Elevated Railroad Loop. City Ticket Office, 111 Adams St. 'Phone Central 2057.

ADDITION TO FIRE BRICK PLANT.

The site of the old Falcon mill will be utilized by the Niles (Ohio) Fire Brick Company by the erection of a new department which will be operated in connection with the present brick plant for the manufacture of fire brick. The new department will have a capacity of 20,000 brick a day. Eight kilns will be added with all the necessary machinery. One hundred and twenty extra men will be necessary to operate the new addition, which will entail an expenditure of $100,000.

◆

WARM TARIFF DISPUTE OVER IMPORTED BRICK.

A customs case of much interest to importers and American manufacturers of fire brick came up for argument before General Appraiser Sharretts of the Board of United States General Appraisers. The case was that of O. G. Hempstead & Son of Philadelphia.

It appears that the collector of customs at Philadelphia levied a duty of 25 per cent ad valorem on importations of magnesite brick. This return was challenged by the importers, who set up the claim that the merchandise was dutiable at only $1.25 per ton, under the provision in the Dingley tariff law for "fire brick." The collector based his assessment on the ground that the brick were "other than fire brick," as specified in paragraph 87.

At the hearing practically every manufacturer of note of fire brick in the United States was represented. The manufacture of magnesite brick in this country has assumed large proportions, and it was made clear that if merchandise of this class is to be admitted at the lower rate, the domestic makers will have to go out of business.

John A. Kemp, United States treasury counsel at New York, appeared in behalf of the government. He had many witnesses, who gave it as their opinion that the term "fire brick" in the present tariff law does not include magnesite brick. On the contrary, the witnesses agreed that magnesite brick is properly dutiable under paragraph 87 in the proviso for "other than fire brick."

The government witnesses said that the term "fire brick" had a well-defined meaning in trade and commerce which excludes magnesite brick from customs classification as "fire brick." It was brought out that the principal use of these bricks is in the lining of retorts and ovens for making steel. The evidence placed before General Sharretts tended to show that the value of the better grade of fire brick ranges from $20 to $25 per ton, while the value of magnesite brick of corresponding size approximates from $125 to $130 per ton. The further claim was made by the domestic interests that while the duty of $1.25 per ton on fire brick of commerce would equal 10 per cent of its value, the same specific duty on magnesite brick would be less than 1 per cent.

J. S. Tompkins, who appeared for O. G. Hempstead & Son, said that magnesite brick having been provided for denominatively in paragraph 77 of the tariff act of 1894, at the rate of $1.00 per ton fixed a legislative interpretation which Congress understood as including the magnesite brick under the term "fire brick" in the Dingley tariff.

The hearing developed the fact that the domestic manufacturers are very much interested in the final outcome of the case, as they allege that a duty of less than 1 per cent on imported magnesite brick will seriously affect their business.

At the close of the afternoon session Mr. Tompkins asked that an adjournment be taken in order to give him time to summon witnesses in behalf of the importers. This request was granted.

PITTSBURG BRICK OUTPUT IS SOLD.

There are already enough buildings under way or projected to keep the Pittsburg building trades busy the greater part of the summer. One startling fact brought to light during the week was that the output of every brick manufacturing plant in Western Pennsylvania is sold. Orders have been placed that cannot be delivered until early in the fall, and all orders now going in are for still later deliveries. There are about 12 large plants in this end of the State, but they will not be able to supply the demand and orders are being sent to outside concerns. Several companies are preparing to enlarge their plants to increase the output.

The market house building project reported during the week calls for an expenditure of $3,000,000, the promoters saying that they intended to incorporate the company and then have an ordinance passed by councils, granting them a 99-year lease, on condition that the building revert to the city after the expiration of the lease.

◆

ANOTHER NEW YORK BLOWER CO. CATALOGUE.

A circular No. 59 on forges for Manual Training Schools, Railroad Shops, etc., has just been issued by the New York Blower Company. With their usual progressiveness they have incorporated several new ideas in the construction of these forges. Especially the moving device for down-draft hoods arrested our attention as being unique, simple and efficient.

As they also manufacture a full line of Blowers, Exhaust Fans, Ventilators and Galvanized Iron Piping, they are, of course, prepared to furnish a full and complete equipment for any shop.

When writing for circular, address The New York Blower Company, 25th Place and Stewart Ave., Chicago.

◆

COMMISSIONER MAYBURY ADVISES CITY TO PURCHASE OHIO PROPERTY.

Detroit is to have a brick plant.

Commissioner of Public Works Maybury made a report on his inspection of the various plants which were offered for sale to the city.

Accompanying the report was a recommendation that the plant offered by the C. W. Raymond Co. of Dayton, O., be purchased. The sum asked is $47,505. The amount allotted by the council for that purpose was $50,000.

A few days ago the commissioner, accompanied by President Reinhardt of the common council and Ald. Moeller, chairman of the committee on streets, visited the plant in Ohio and seemed pleased with it. Commissioner Maybury is convinced it can furnish 20,000 brick a day and that a substantial saving to the city will be the result.

Another report was submitted concerning shale. It was found that on the first attempt to establish a plant that suitable bids for shale could not be secured. George W. Reutter put in a bid of $1.20 a ton net and the commissioner accepted it.

The council decided to refer the matter to the committee on streets. It is not likely that the plant will be used this year, as the city already has contracted for its brick supply.

THE AMERICAN'S 1905 CATALOGUE.

The 1905 catalogue of the American Clay Machinery Co., Bucyrus, Ohio, is out, and as usual it is large, complete and very useful to a clayworker. It contains nearly 400 pages, is printed on high class enameled paper and carries an illustration on almost every page—everything from a brick pallet to a complete plant is shown for making soft mud, stiff mud, dry press, sand-lime, sand-cement and paving brick, pottery and cement machinery, waste heat, steam and hot air dryers. This company are the largest manufacturer of clay machinery and appliances in the world. They have two plants working hundreds of men at Willoughby and Bucyrus, Ohio, and maintain a New York and Chicago office, besides one in New Zealand, Japan, Mexico, England, Spain and the Philippine Islands.

If you are interested in any of these industries you can secure without any charge a copy of this catalogue by addressing them at their main office in Bucyrus, Ohio.

THE RICKETSON MINERAL COLORS.

The Ricketson Mineral Colors for producing different color effects on clay, cement or sand-lime brick and cement sidewalks, are the strongest on the market. Ricketson's Red contains over 90 per cent of coloring matter and their other colors are equally as good for either strength, durability or quality.

The Louisiana Purchase Exposition jury gave the Ricketson Mineral Paint Works of Milwaukee, Wis., the highest award. Write direct to them if you wish information and samples.

THE SCOTT NOISELESS PLANT.

The Scott Manufacturing Company, of St. Louis, Mo., have just sent out to the trade a rather neat catalogue on the Andrus Brick Press and its necessary equipment. The Andrus press is one of the oldest that is now on the market and judging from the testimonials it is a very successful one. It is now built only in the four mold size. The Scott Clay Pulverizer is another Scott idea. It is a well made machine and is also quite a favorite. The Scott Clay Mixer belongs in the same class. If you are interested it might be well to correspond with them at 609 Commonwealth Trust Bldg., St. Louis, Mo.

AMERICAN MAGNESITE CO. ACQUIRES LARGE FACTORY SITE ON PACIFIC COAST.

According to advices from San Francisco nearly thirty acres of water front land in East Oakland, Cal., on Sessions Basin, has been purchased by the American Megnesite Co. for a factory site. Construction of the plant will commence immediately. There is ample area for the different plants that will be erected by the magnesite company for the handling of its ore. One plant will be for the manufacture of fire brick, another for the manufacture of a patent building material, a third for the manufacture of carbonic acid gas and in addition there will be wharves and bunkers for the shipping of iron ore.

NATIONAL COMPANY BUYS LAND FOR THREE YARDS, INVESTING $400,000 IN THE PLANTS.

The National Brick company, Chicago, a new organization to compete with the Illinois Brick company, which practically controls the brick market here, is about to construct three big plants. It has purchased 180 acres of land at Maynard, Ind., 80 acres at Chicago Heights, and 40 at Weber Junction, on the Chicago and Northwestern railroad. It will expend approximately $400,000 in the purchase of land, buildings, and equipment, and will have a working capital of $100,000. B. F. Weber is president; F. W. Labahn, vice president; H. Busse, secretary; Louis Riemer, treasurer.

MAKING BRICK OUT OF TAILINGS.

Joplin, Mo.—One of the brightest looking industries in the Southwest is the new discovery of making brick out of "tailings" or "chats," which is waste material from the zinc mines at Joplin. The "chats" are ground to a powder and mixed with hydrated lime by a process similar to the manufacture of the sand-lime product. From the tests made they are pronounced superior to the sand-lime brick, being finer in texture, stronger in crushing strain, less absorbent and neater in appearance. The brick resemble Colorado granite. The Missouri Granite Brick Company of Joplin, a corporation of $160,000 capital, has just purchased a site on which a large plant will be built at once. The plant will have a daily capacity of 80,000 brick.

SAND BRICK STAND A HARD TEST.

The St. Paul (Minn.) Brick company has just had a series of tests of their product made by Prof. F. H. Bass of the University of Minnesota. These tests were personally conducted by the professor and were to establish the absorption of water and crushing strength of these bricks. They were immersed in water for eighteen hours for the absorption test. For the crushing tests loads were applied at the rate of 10,000 pounds per minute, and represent the true crushing strength of the brick.

The tests were conducted on twelve sand lime brick. The brick weighing the least as received was 4.60 pounds, and the weight of this brick after immersion was 5.17 pounds. The brick weighing the most was 4.79 pounds and after immersion it weighed 5.27 pounds. The average percentage of weight of water absorbed in the twelve bricks was 11.3. All the brick were the same size and contained 31 square inches. The average total load in the crushing tests was 48,496, and the average pounds per square inch was 1.564.

It is said these tests are unusually good and thoroughly demonstrate the value of this brick for building purposes. The statement that there was a prospect such a factory might be established in Winona has given rise to much favorable comment, and the hope is quite generally expressed that this project may be pushed to a successful conclusion. It would add another valuable plant to the manufacturing industries located in this city within the past two years, and the business is one that if started would be capable of considerable development.

SAND OR LIME-BRICK OR BLOCK NEWS.

E. A. Enos & Co., Connersville, Ind., will make cement blocks.

The Uniform Brick Co. is arranging to start a plant near Hudson, N. Y.

The Saginaw (Mich.) Pressed Brick Co. has increased its capital stock to $50,000.

The McArthur (Ohio) Clay & Cement Block Co. has been incorporated, with $50,000 capital stock.

The Owensboro (Ky.) Sand-Lime Brick Co. have let the contract for their new plant, and the buildings are now being constructed.

The Rochester (N. Y.) Composite Brick Co. have decided to locate their factory at Brighton. Robert E. Gay has been retained as the manager.

The Federal Lime Brick Co., Scranton, Pa., will build a sand-lime brick plant at Sayre on land belonging to the Sayre Sand & Plaster Co.

The Tri-City Sand Stone Brick Co., Moline, Ill., has been incorporated with $9,000 capital stock by B. F. Peek, C. E. Dietz and G. A. Shellburg.

The C. F. Smith Stone & Brick Co., Appleton, Wis., capitalized at $20,000, will manufacture cement brick and deal in stone and brick generally.

The Newburg (N. Y.) Brick Co., manufacturers of sand-lime brick in New Windsor, expects to have its plant ready for operation in a short time.

The Missouri Granite Brick Co., Joplin, Mo., incorporated at $60,000 capital stock, will build a plant to make granite brick. A. V. Boswell is the manager.

John L. Sommers, general manager of the Sioux City (Ia.) Brewing Co., will head a company to be organized to make sand-lime brick in Sioux City.

The Florida White Pressed Brick Co., of Green Cove Springs, will install in Jacksonville the first of a series of plants. The second one will be at Green Cove Springs.

The Wichita (Kansas) Crystal Brick Co. has been organized with $65,000 capital stock. C. B. Achenbach, secretary; J. C. Dwelle, treasurer. All are from Chanute, Kansas.

The Green Pond Granite Brick Co., Gibson, N. C., is now making brick. John F. McNair, of Wilmington, is the president. W. T. Pate is the secretary and treasurer.

The Janesville (Wis.) Granite, Brick & Stone Co., has been incorporated with $35,000 capital stock. The incorporators are James Shearer, Grant Fisher and James Lamb.

Alfred Patterson and Capt. J. E. Kaiser are considering the building of a sand-lime brick plant at Winona, Minn. They are now successfully running the St. Paul (Minn.) Brick Company, making sand-lime brick.

The Camden (N. J.) Granite Brick Co. has begun work on the erection of a $25,000 brick plant on the outskirts of Haddonfield. The officers are Edward H. Bell, president; L. K. Ewing, secretary; R. A. Rockhill, treasurer.

The Aberdeen (Miss.) Sand-Lime Brick Co. has been organized with $35,000 capital stock. Baxter McFarland is president; S. H. Berg, vice-president and manager; C. E. Hamilton, treasurer, and Addison Brannin, secretary.

MISCELLANEOUS ITEMS.

D. S. Lake will establish the second brick yard at Shenandoah, Iowa.

J. C. Dowdy, of Jonesboro, Ark., will erect a brick plant at Harrisburg.

Arrangements are about completed to start a brick making plant at Pleasanton, Kansas.

The plant of the Brick & Tile Co., at Hastings, Okla., will soon be ready for operation.

Harry Thackery has rented the tile factory of Mr. Dille, at Mt. Victory, Ohio, and will operate same.

J. W. Pratt, of Rector, Ark., is inspecting clays at Alice, Texas, with a view of opening a brick yard.

Minor Smith has been employed to take charge of the Wadsworth (O.) Brick & Tile Co.'s works.

Joseph Mayone has leased the Porter Brick Yard at Saugerties, N. Y., and will manufacture brick this season.

The Superior Brick, Tile & Pottery Co., Snohomish, Wash., will build a large brick making plant at Woodinville.

A company has been organized at Cleveland, Okla., for the manufacture of vitrified brick. They will make 50,000 brick daily.

It is reported that S. Caldwell, of Abbeville, and L. P. Brinkman, of Mt. Vernon, Ind., will start a brick plant at Abbeville, La.

L. H. Skiles and Carl Ericson, Virginia, Ill., have formed a partnership and will succeed A. W. Anderson in the brick making business.

J. S. Stoner and Wm. H. Smith, of the Mahoningtown, Pa., Bank, are forming a company to make brick at the rate of 35,000 daily capacity.

The Newport (Ind.) Brick & Clay Co. have just received two more carloads of machinery for their plant and are getting ready to open it up.

The Peebles Paving Brick Co., Portsmouth, Ohio, has decided to increase the output of their plant. Additional machinery will be installed at once.

Messrs. Swift & Gregg, Waverly, Ill., have sold their brick and tile plant to Theodore Fisher, of Beardstown, Ill., and will move there and operate it.

W. P. Allen has moved to north 7th street, Abilene, Kansas, and during the season will erect a 20,000 capacity brick plant if the clay tests are favorable.

F. L. Dixon, J. R. Kennedy, W. Taylor and J. R. Paupose, of Grand Forks, N. Dak., expect to locate a brick works that will cost $15,000 at Thief River, Minn.

At a recent meeting of the Lima (O.) Tile & Brick Co. final plans for commencing construction work on the plant was arranged. T. J. Tennehill is the manager.

The Franklin, Pa., Brick Works has been leased by E. W. Echols to Wesley S. Kramer and A. Marshall, of the firm of Marshall Bros., Pittsburg, Pa., who have already commenced making repairs and will increase the capacity of the plant very shortly.

L. Vincent Metz & Co., Erie, Pa., are considering the building of a brick and tile factory at the new town, Sarpy City, Neb., on the O. L. & B. Ry., near Omaha.

The stockholders of Bloomer Bros. Company, Newark, N. Y., have altered their certificate of incorporation so that they can manufacture concrete blocks, brick or tile.

The shale tests have been completed and a company is likely to be organized to make vitrified paving brick at Hutchinson, Kansas. Mr. Burtch had the clay tested.

The new brick works of the Union Mining Co., Mt. Savage, Md., which have been in course of construction for the past eight months, have been completed and started up.

A. S. Hurley, who has been engaged in the brick works at Sheldon, Ia., for five years, has moved to Hamburg, Ia., and will take the management of the brick and tile plant there.

H. Copping, recently manager of the Powhatan Clay Mfg. Co., Clayville, Va., has gone to England to live, and Mr. A. L. Martin, of Hallsboro, Va., is now the manager.

The McNally Brick Works, Union, S. C., has started up with an up-to-date brick making outfit. P. A. McNally is the manager and Mr. Jackson, of Greensboro, N. C., is the superintendent.

The Decatur (Ill.) Brick Co. recently held their annual meeting and re-elected the old officers. J. F. Mattes is president; H. Schlauduman, vice-president, and S. A. Tuttle, secretary-treasurer.

H. M. Deavitt, 140 Dearborn St., Chicago, is a practical and consulting chemist. He will analyze your materials, clays, shales, sands, cements, etc. Write to him if you want good work and reliable.

C. B. Platt, Van Meter, Iowa, writes that he is doing well with the McManigal furnace and kilns; that he has sold them at Marengo, Gladbrook, Decorah and Monona, Iowa, and had many inquiries.

The Western Fire Clay & Quarry Co., St. Louis, Mo., has been incorporated with $10,000 capital stock, all paid in. The incorporators are James D. Houseman, Carl O. Houseman and C. H. Huff, of St. Louis.

The Ashland-Ironton (Ohio) Fire Brick Works, No. 1, are now in full operation, and F. E. Hayward, the general manager, has just closed a contract for 1,500,000 pavers. The company is making some additions.

The Reliance Machine & Tool Works, St. Louis, Mo., are meeting with great success in putting their new press on the market. Several new orders have been received, and the presses already installed are working finely.

The Burns-Hancock Fire Brick & Clay Co., Montezuma, Ind., has been incorporated, with $100,000 capital stock. Directors are Edward H. Burns, S. P. Hancock, L. B. Hancock, C. Kuhn, F. D. Stanley, B. Stanley and Joseph Burns.

The National Paving Brick Co., Buffalo, Kansas, is the name of a new company that will build a plant there. J. W. Pratt of Chanute is the engineer. The plant will be located on the O. C. Boggs farm, northwest of town, and north of the present brick plant.

The Central Ohio Roofing Tile & Brick Co., Columbus, Ohio, has increased its capital stock from $30,000 to $60,000.

The machinery for the Miller Bros.' new brick plant at Paxinos, Pa., has been installed and the plant put into operation.

W. O. Taylor, 916 Church St., Lynchburg, Va., and others, contemplate organizing a company to establish a brick works.

The Osgood (Ind.) Tile Co. has been incorporated with $5,000 capital stock. Directors: George Ashman, Wm. C. Leslie, O. R. Jenkins and T. R. Hartley.

The old Relitz yard at Wausau, Wis., is to be opened by John and Richard Relitz under the firm name of Relitz Bros. The plant has been idle for six years.

Horace McBride, Carlinville, Ill., has leased the Shale Brick & Tile Works to Wm. Rabb and Wm. Kuester for a term of years. The plant has been idle for some time.

C. O. Jackson, Marysville, Tenn., is removing the machinery of the Jones Brick Works to a new location near the stove works, and has bought Mr. Jones' interest in same.

The Newton Fire Brick Co., Albany, N. Y., which has been in the hands of a receiver for some time, has been reorganized. Col. W. G. Rice is president; Chas. H. Sabine, vice-president; C. B. Flint, treasurer and general manager; F. W. Kelley, secretary. The Newton Company has been incorporated with $100,000 capital stock.

FOR SALE OR LEASE.

Largest and Best Equipped Plant in the Country for the Manufacture of White and Light Shades of Vitrified or Impervious Front Face Brick.

Plant is in close proximity to practically unlimited supplies of white clay, and in addition to facilities for manufacturing white and light face brick, has complete clay washing or refining outfit.

Best of Reasons Given for Selling or Leasing.

An Exceptional Opportunity will be Afforded to Interested Persons.

Capacity of the plant is 5,000,000 per annum. A wide introduction has been secured among the leading architects and builders of the country, with an unlimited demand for an increase of the output.

Every facility will be afforded for an examination of the plant.

Working capital only will be required if leased by responsible and capable persons. Or, the plant will be sold at a decided bargain.

A Most Unusual Opportunity is Presented.

For further particulars, address

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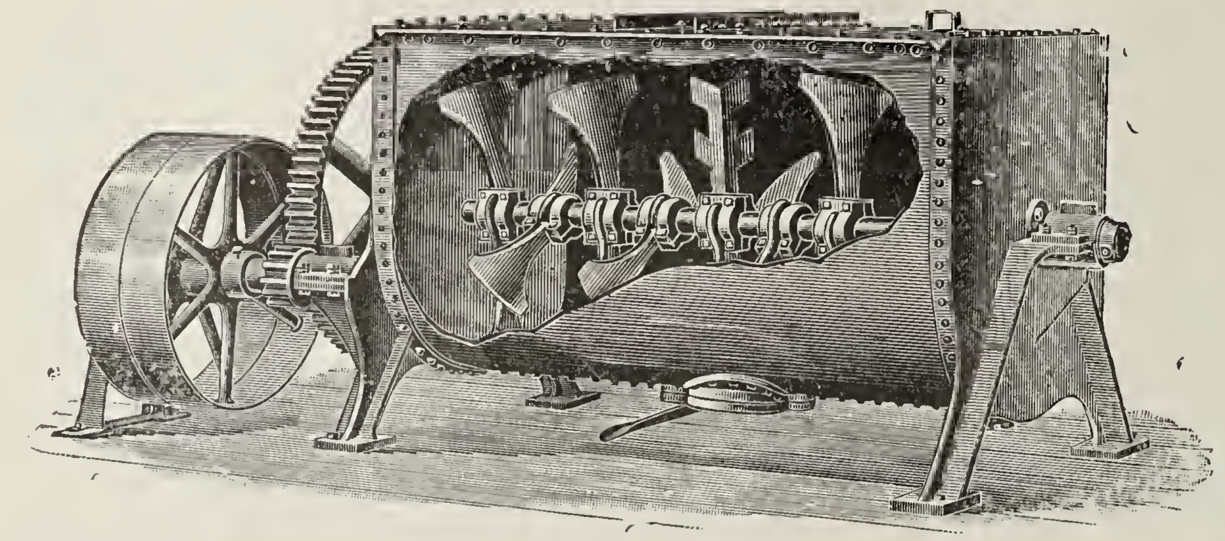

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The C. O. Bartlett & Snow Co., Cleveland, Ohio, U. S. A.

FOR SALE.

Sand-Lime Brick Factory, in progressive Southern seaport city of over 25,000 inhabitants Finest climate in the world. Factory in full operation. Over 2,000,000 brick made and sold. Inexhaustible supply of sharp sand. Shipping facilities unsurpassed. Plant costing $30,000, located on entire city block, 330x330 feet. $6,000 new machinery just added. Reason for selling, owners are engaged in other business and cannot give this their personal attention.

OPPORTUNITY, care Clay Record.

BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

FOR SALE.

White Glass Sand or Sand Brick Property, near St. Louis, Mo.. Situated on two roads. All facilities. Switches on property. Address

M. S. G.,
Care Clay Record, Chicago, Ill.

FOR SALE.

Brick and tile plant. Stiff Mud. Continuous kilns. Steam dryer. Good clay and excellent market.

D. W. TOWNSEND,
Cherokee, Iowa.

FOR SALE.

One J. D. Fate A Special Auger Machine, 40,000 brick per day. In first class working order.

REDFIELD BRICK & TILE WORKS,
Redfield. Iowa.

FOR SALE.

20,000 fine pallets. $30.00 per thousand, F. O. B. cars here.

JOHN BUCKLEY,
Frankfort, Ky.

NEW AND SECOND-HAND MACHINERY FOF SALE.

One No. 6 Machine, capacity 50 to 75 thousand brick per day.
Three "Eli Jr." Brick and Tile Machines.
One "Little Eli" Brick and Tile Machine.
One No. 1-A Brick and Tile Machine, with square hopper.
One No. 1 Brick and Tile Machine, with upright pug mill, second-hand.
Two No. 2-B Brick and Tile Machines, with square hopper.
Two No. 5 Disintegrators, capacity 40 to 60 thousand per day.
Two No. 1 Disintegrators, capacity 25 to 35 thousand per day.
Three Winding Drums or Hoists.
One "D" Freese Tile Machine, second-hand.
One 30 h. p. Engine.

Above machinery is same as new and will be sold cheap. It is guaranteed to be as represented in circulars mailed on request.

JAMES F. CLARK,
Morenci, Mich

Machinery For Sale.

FOR SALE.

50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets. Track gauge 25 inches.
Both styles of cars in first-class repair.

ATLAS CAR & MFG. CO.
Cleveland, Ohio

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine. Address

"GIANT,"
Care Clay Record, Chicago.

FOR SALE.

1 Raymond Victor double die steam repress.
1 Raymond Columbian double die steam repress.
1 American Clay Working Machinery Co. Eagle double die steam repress.
3 Bonnot double die steam represses.
2 Penfield single die steam represses.
1 four-mold Boyd Dry Press, new.
All in thorough repair.

Address E. C.,
Care Clay Record.

FOR SALE—CHEAP—1200 Steel Crimped Pallets. 10x34 inches. Address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—New and re-laying rails, 12, 16, 20 and 25 pound. For prices, address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE.

Four-Mold Dry Press, absolutely as good as new. made only one kiln of brick. Can sell for less than half original price. Address

"DEALER," care Clay Record.

FOR SALE.

One E. M. Freese & Co. stiff mud Union Brick Machine, with pug mill combined. Special size.
One E. M. Freese & Co. rotating automatic cutter.
Two Stevenson nine-foot iron dry pans.

THE EGGERS BRICK CO,,
Cleveland, Ohio.

FOR SALE CHEAP.

One "Freese" Union Brick and Tile Machine, size No. 1, with dies and table. Good running order. Address

L. H. PROWANT,
Continental, Ohio.

FOR SALE.

One Conical Smooth Roll Crusher No. 25, Style "F," manufactured by American Clay Machinery Co., Bucyrus, O. One No. 5 board delivery side-cut Brick Table. This table has never been used. For information, write

STRAIGHT BROS.
Fonda, Iowa.

Do Your Brick Turn White?

HERE IS THE REMEDY.

PRECIPITATED

Carbonate K.B. C.F.H. of Barytes

The only preventative for scum and discoloration on facing Brick and Terra Cotta; neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

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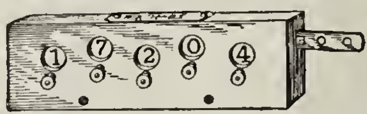

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4 Wheel, $3 00
5 Wheel, $3.25
Guaranteed.
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Sold by all dealers
R. A. HART. 41 White St., BATTLE CREEK, MICH

WNAT IS THE MATTER

With the Fate Brick Machine and Bensing Cutting Table? We are offering the Premier Combined Pug Mill and Brick Machine of the J. D. Fate manufacture with Bensing Automatic Side-cut Cutting Table, complete, practically as good as new, at $600.00 f. o. b. our works. Capacity of this machine 5,000 to 6,000 per hour. This is not half the price of a new machine, and if you can use this kind of a brick machine and cutting table, it is a great bargain. If we cannot get our price we will sell at the best cash offer we can obtain. Machine has been idle since the 1st of January, 1905. Write immediately.

THE VULCAN CLAY CO.,
Wellsville, Ohio.

FOR SALE.

Drain Tile and Brick Plant for sale. Good machinery. Good location. Plenty of clay. Price $2300, small payment down, long time on rest. Wil take product as pay. Address

CONTINENTAL,
Care Clay Record, Chicago.

FOR SALE.

One No. 4 Double Mold Brick Repress, made by The American Clay Working Machinery Co. Price $125.00.

REPRESS, care Clay Record,
Chicago, Ill.

FOR SALE.

A 4-Mold Dry Press Brick Machine and a complete wire cut brick outfit. Also Boilers and Engines of all sizes, at a bargain.

MERTES MACHINERY CO.,
Milwaukee Wis.

$25 **FOR SALE.** Enquire about our combination offer. Patent Brick and Tile Kiln and Patent Grateless Furnace. 40 per cent fuel saving. Next best thing to continuous kiln.

PLATT PATENT KILN CO.,
Box 7 **Van Meter, Iowa.**

FOR SALE.

Three 72 Chamber Presses, with rubber gaskets and sacks
One Vertical Double Belt Clay Pump.
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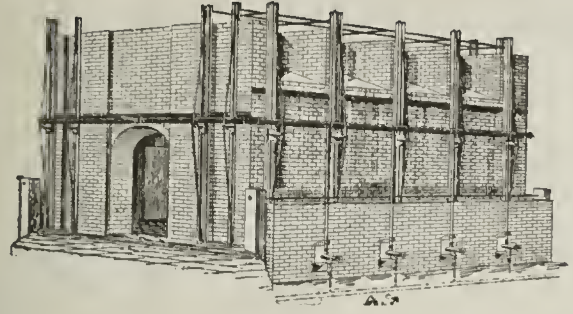

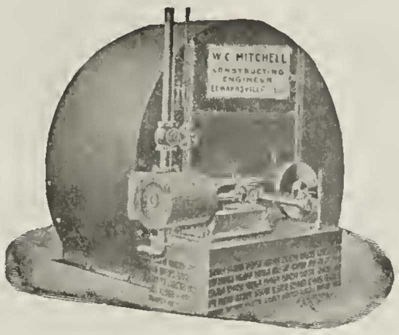

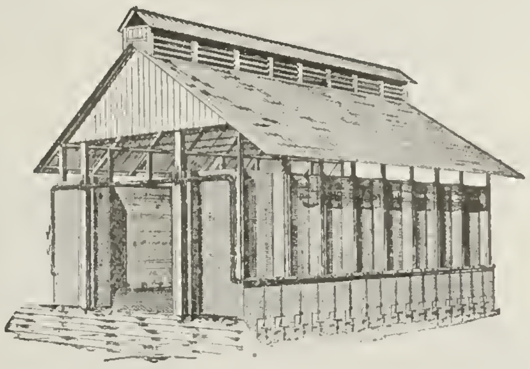

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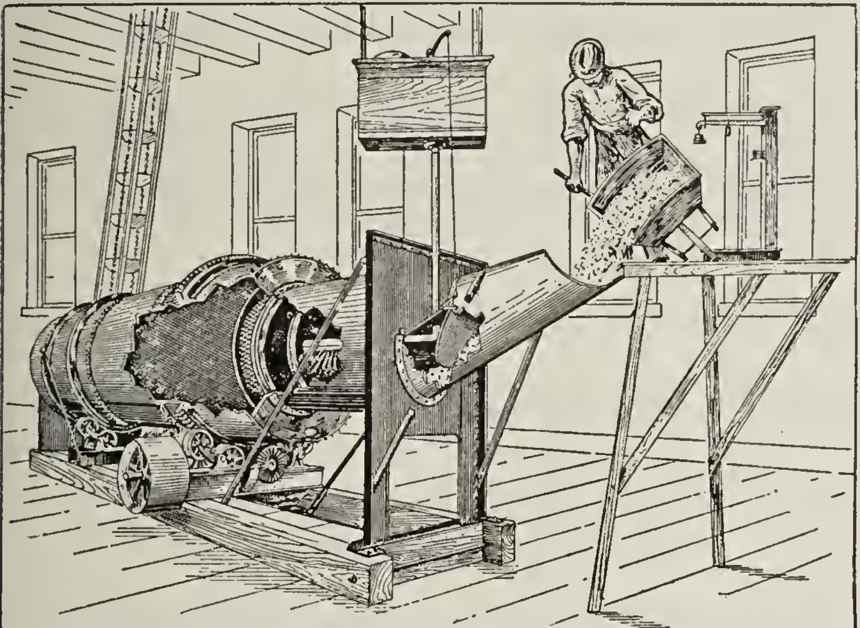

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AUTOMATIC FROM BEGINNING TO END.

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The HYDRATOR, as the machine is called, will do the rest.

No grinding, no separating, no free lime.

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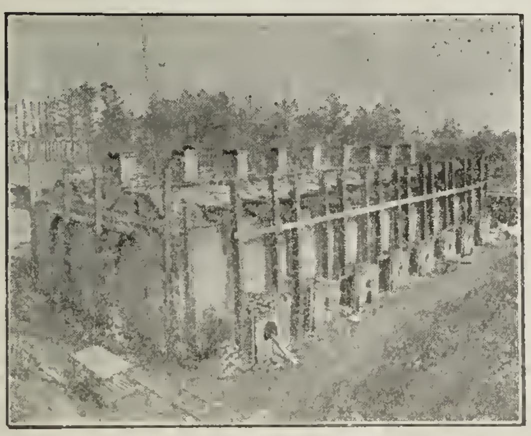

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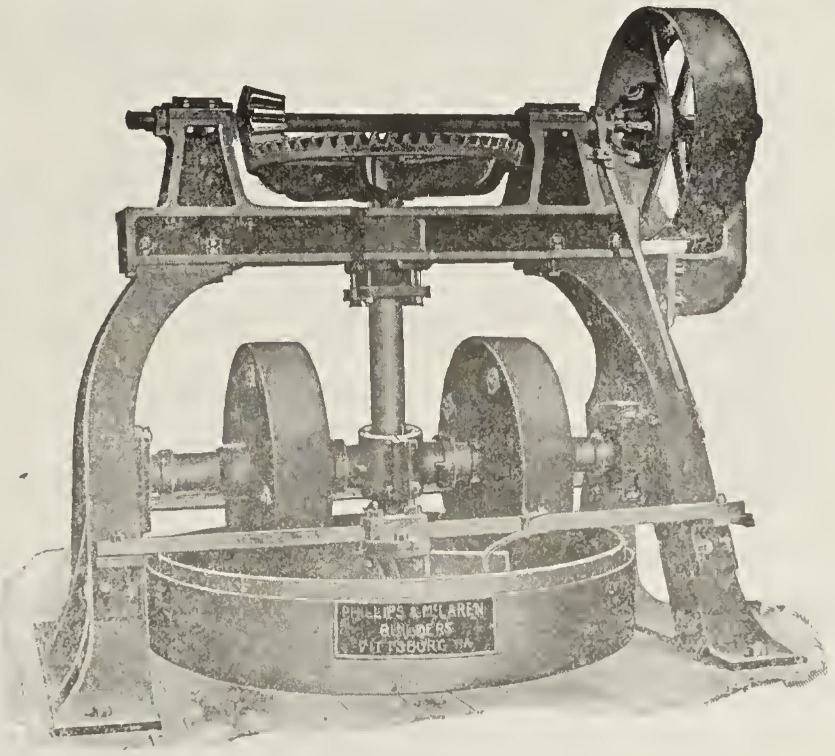

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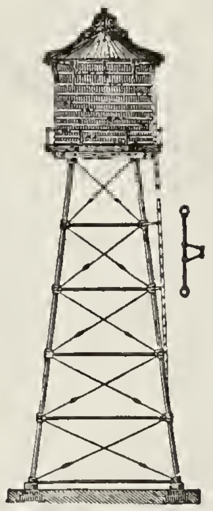

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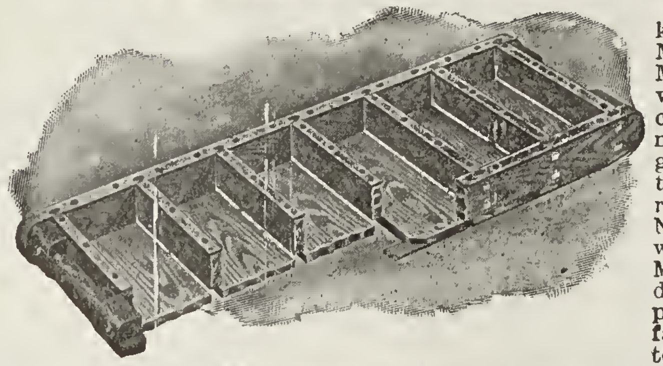

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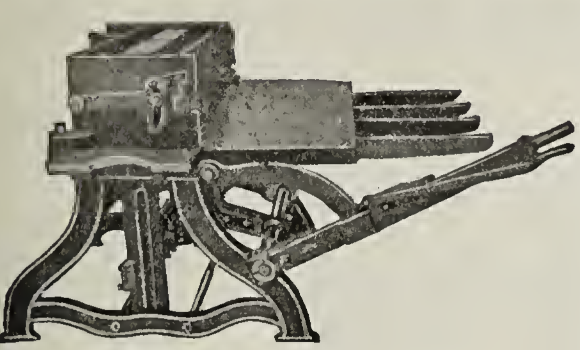

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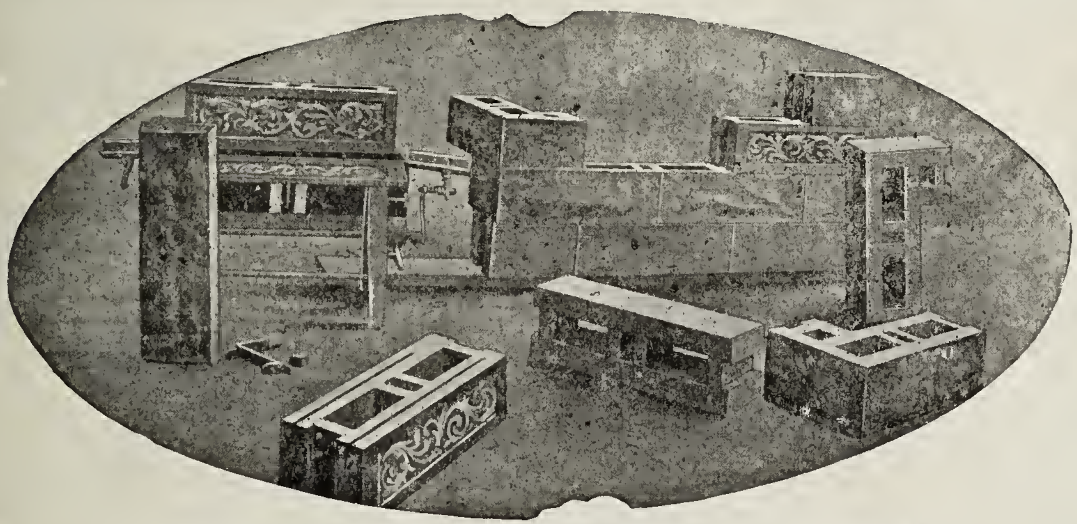

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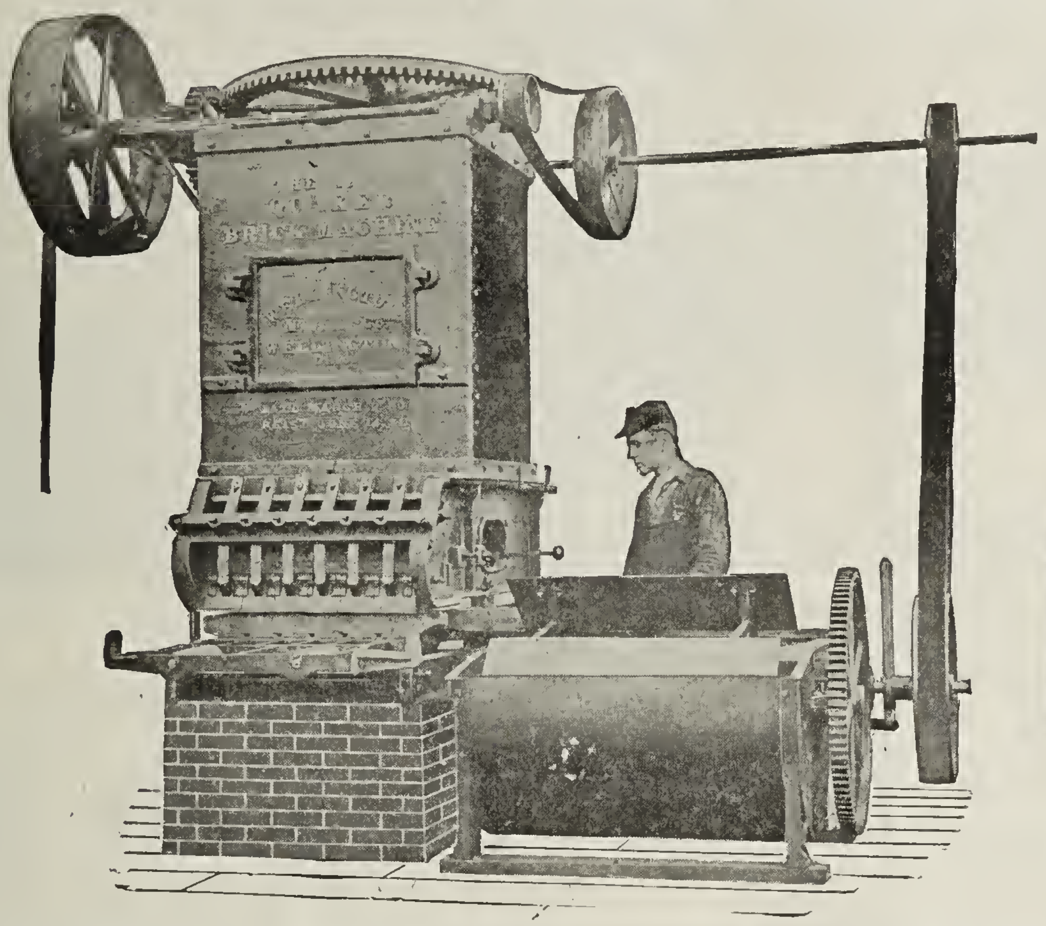

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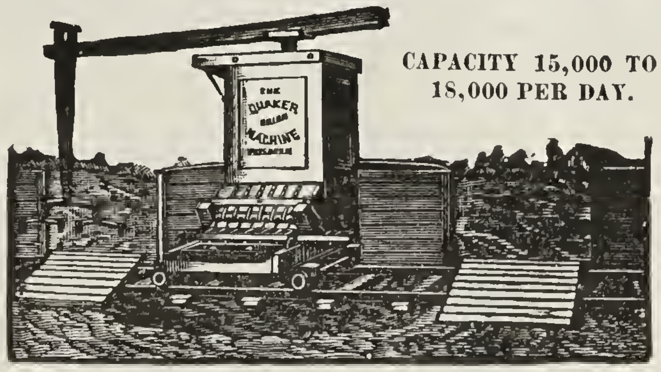

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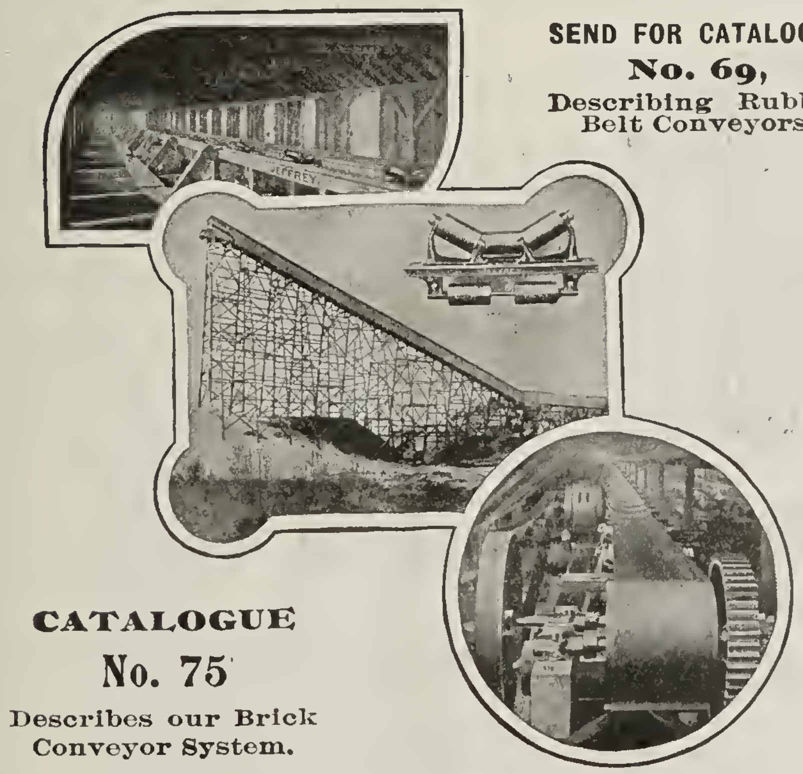

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OUR PORTABLE HOLLOW CONCRETE BUILDING BLOCK MACHINE

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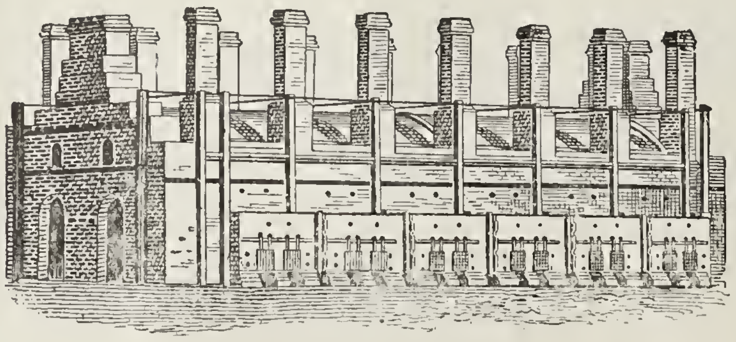

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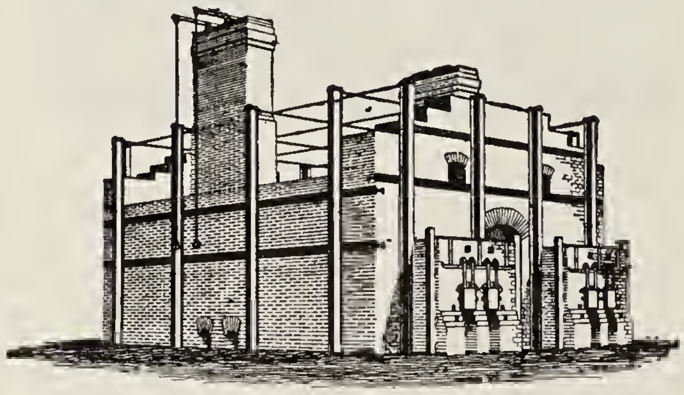

Build the best; it is the cheapest in the end.

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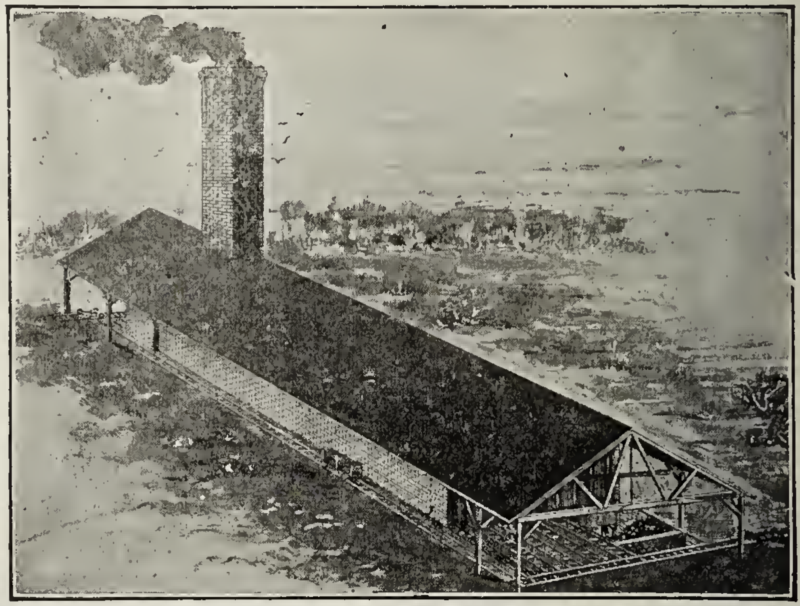

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Plants Erected of any Capacity

Have you any Sand?

If so, you need what we have.

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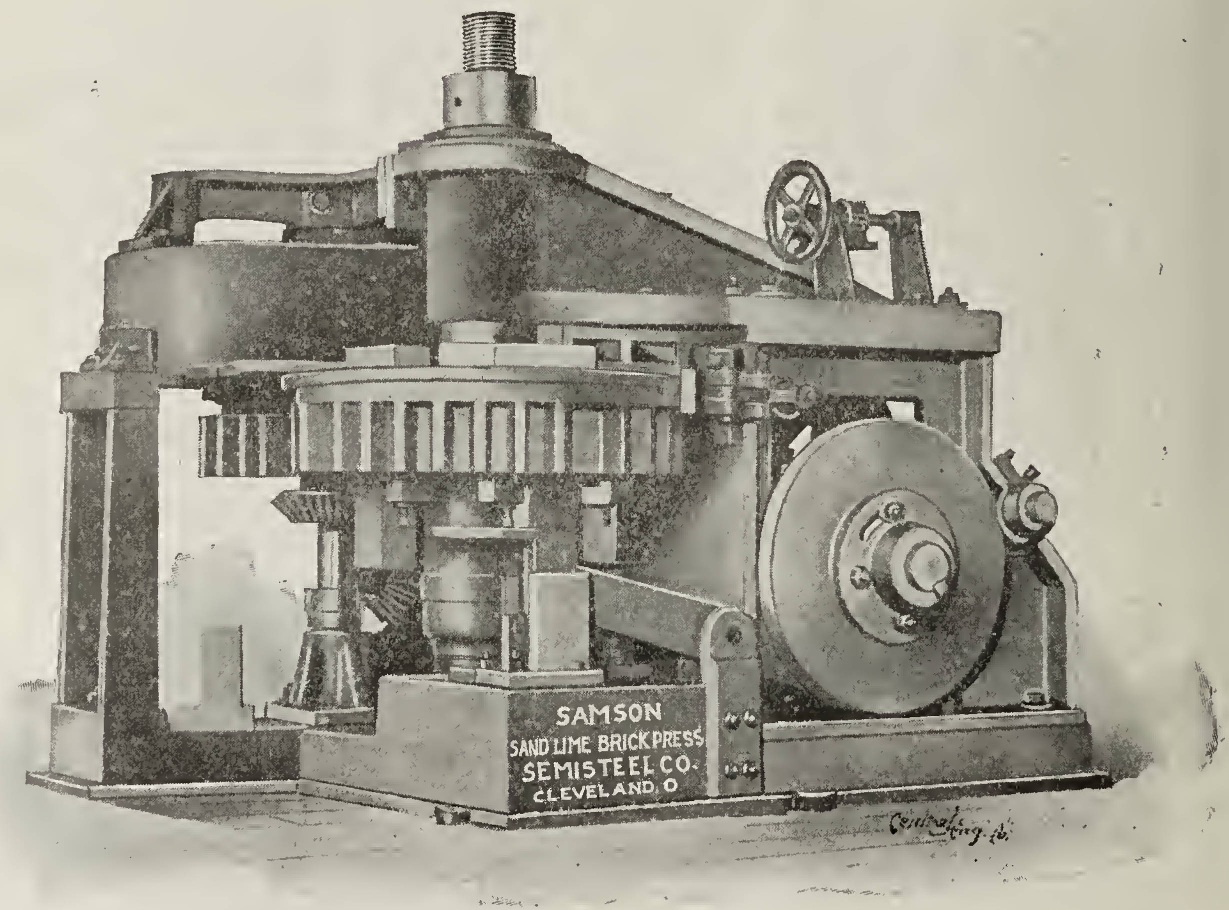

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25 Factories Designed, Equipped and Set in Operation During the Past Year in the United States and Canada.

OUR RECORD: Combined capacity of factories in 1903, 15 million bricks per annum.
Combined capacity of factories in 1904, 150 million bricks per annum.

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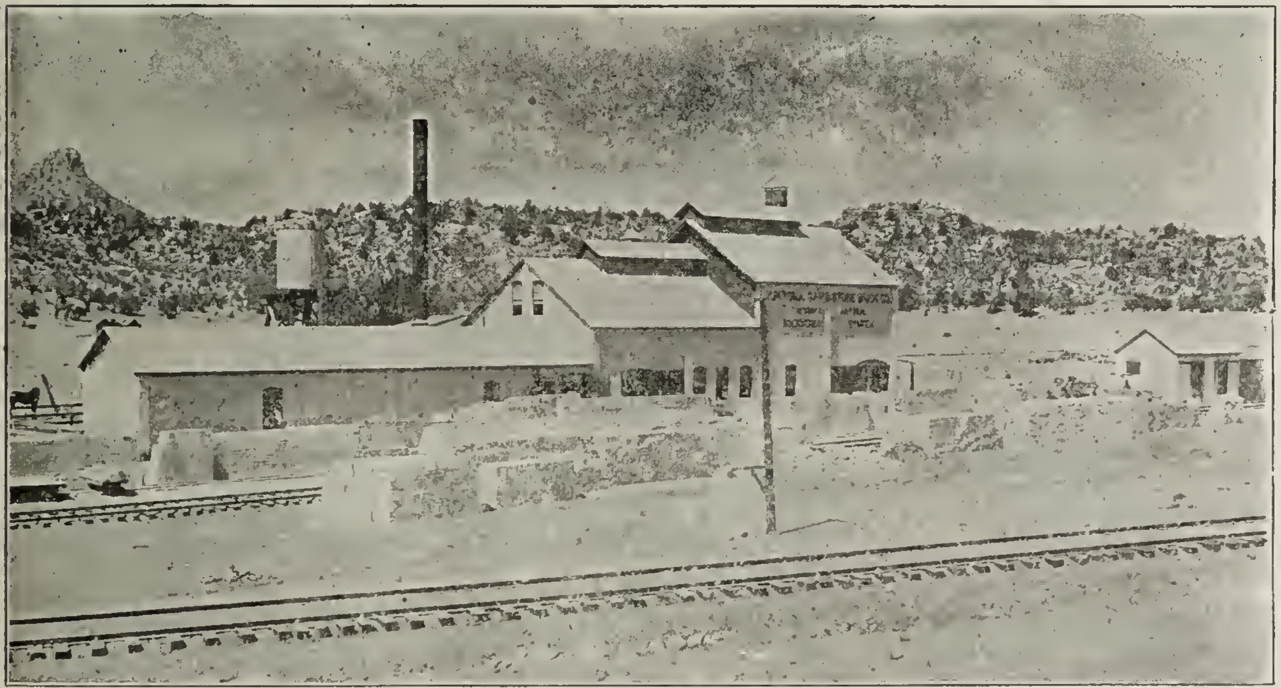
U. S. Company's Quarters, Whipple Barracks, Prescott, Arizona, Erected Out of "Huennekes System" Sand-Lime Bricks



Factory of the Arizona Sand-Stone Brick Company, "Huennekes System" Prescott, Arizona. Finished in Bricks of Their Own Manufacture.

"THINK THIS OVER."

Before the expiration of this year the total combined capacity of the factories erected and operated under the "Huennekes System" will be about 300 million bricks per annum—or a growth of about 2,000 per cent in one year.

Remember the doubts and scoffings about the "dry pressed brick" but a few years ago and the money made by the pioneers in this business.

The Sand-Lime Brick Business is to day in the identical state as the dry pressed brick business was but a few years ago.

All of our special machinery is manufactured in the United States by the foremost machine shops in their particular line of business, and are thoroughly tested, insured and guaranteed before leaving shops. All special machinery, as well as our methods and process are fully protected and covered by United States Patents. **Without the use of the same it has proved impossible to produce a high grade brick out of sand and lime in a commercial way at a low cost. The rapid growth of our business from 15 million brick per annum in 1903 to 150 million brick per annum in 1904** is not only a proof of the merits of the "Huennekes System." but also of the product itself.

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Dry and Wet Pans, Clay Mills, Combination Mills, Elevators, Screens, Trucks and Wagons. PRESSES for Nozzles, Sleeves and Runner Brick for Bessemer Steel Process, Tuyere Presses, etc. DIES for Wall Coping, Flues, Roofing, Traps, etc.

Write for Prices and Terms,
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Nine Foot Iron Frame
DRY PAN

With Independent
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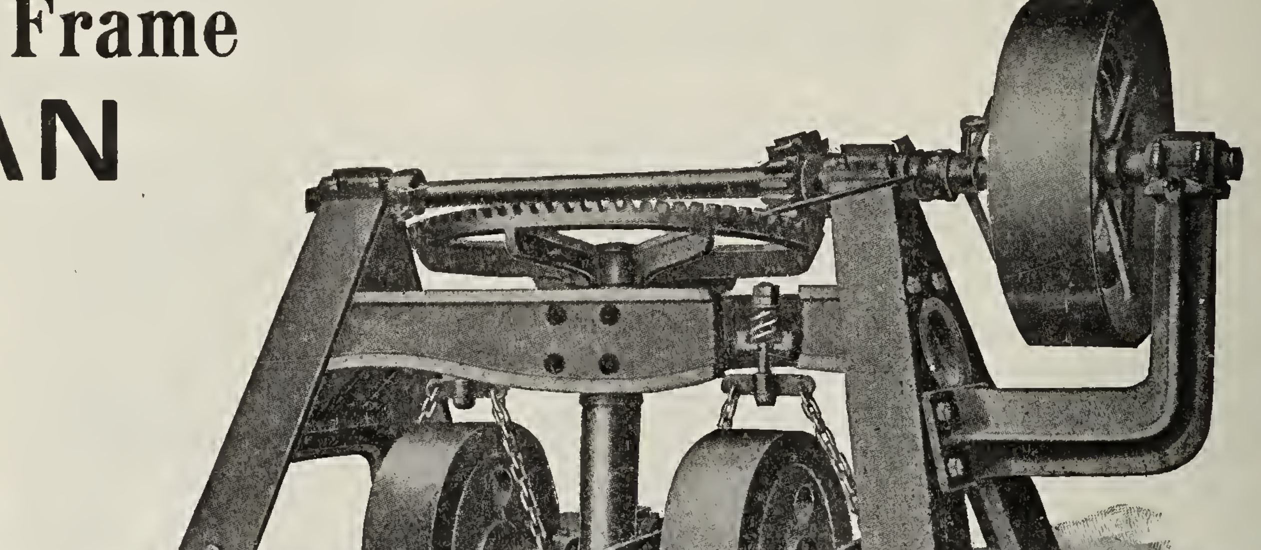

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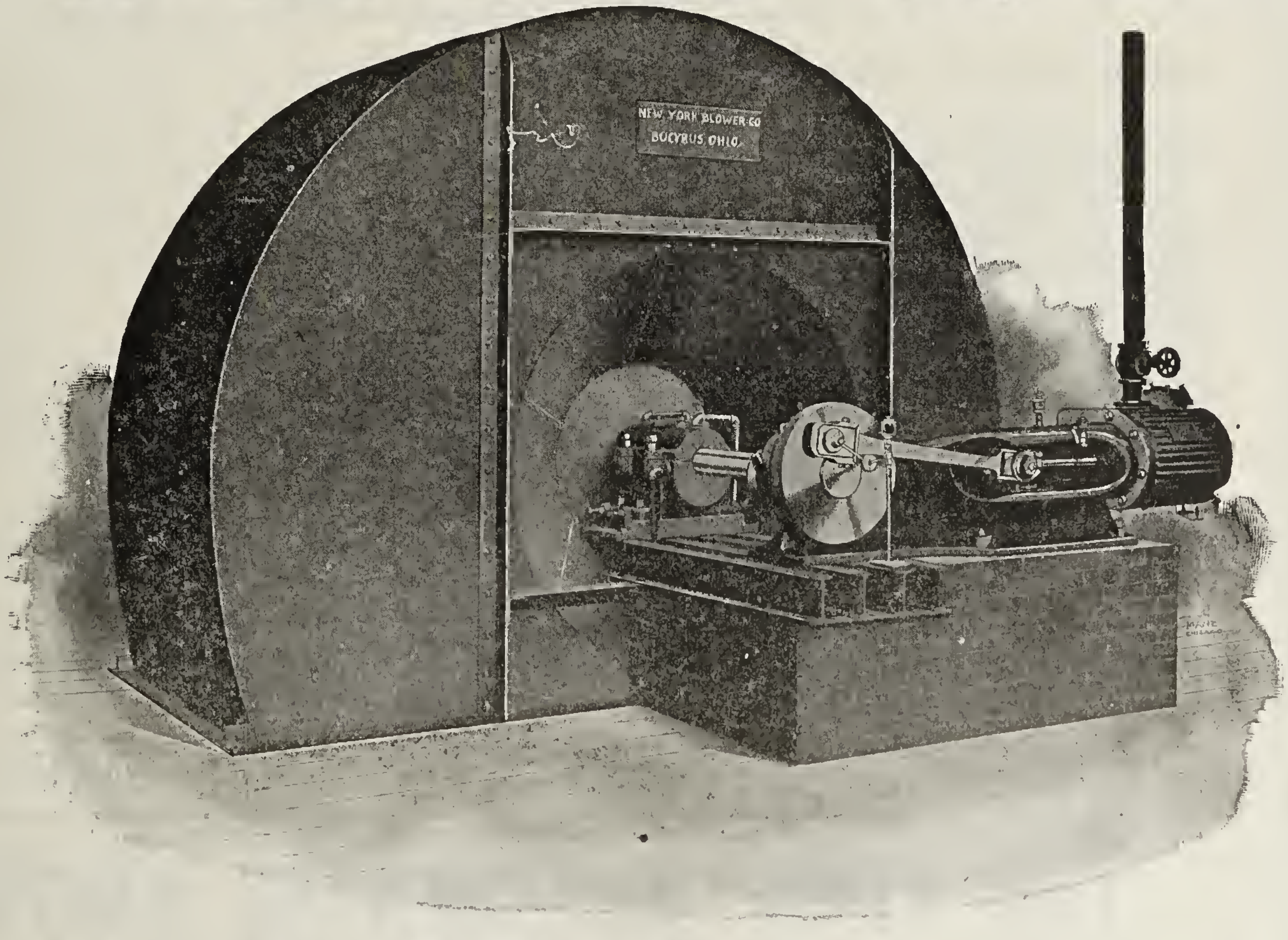
WASTE HEAT CLAY DRYER.

We offer the New York Blower Company's Improved Waste Heat Dryer as the most successful means of utilizing the heat from the cooling kilns which is at present an absolute waste. The two important factors in drying are heat and circulation of air; one being as important as the other. These are both amply provided for in our dryer. By the use of mixing chamber, provided with the proper dampers fresh air can be admitted to the fan to reduce the temperature of the incoming gases to the proper degree. By changing the speed of the fan the amount of air blown into the tunnels is easily regulated. With this apparatus, by which you can readily regulate and control the heat and circulation, you have a dryer which will work successfully in all climates and temperatures The necessity of perfect circulation in a dryer should never be overlooked. With this end in view we provide additional circulating devices in our largest dryers. This maintains an even and positive circulation throughout the dryer and insures the successful drying of your brick.



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25th Place and Stewart Avenue.

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Cathedral Corner, Fennel Street,
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NEW YORK BLOWER CO.
BUCYRUS, OHIO.

A WILFUL waste of WASTE HEAT is a WOEFUL want of BUSINESS FORESIGHT.

In fact, a waste of any kind on a brick plant is a slice off the dividends. This needs no demonstration, nor will it take long to convince you that the **RODGERS DRYER** will stop all dryer leakage and will enlarge the capacity of your plant materially.

WE TEACH YOU HOW TO DRY YOUR BRICK ECONOMICALLY.

Waste no Heat, Waste no Time, Waste no Brick

WRITE TO-DAY TO

L. E. RODGERS ENGINEERING CO.

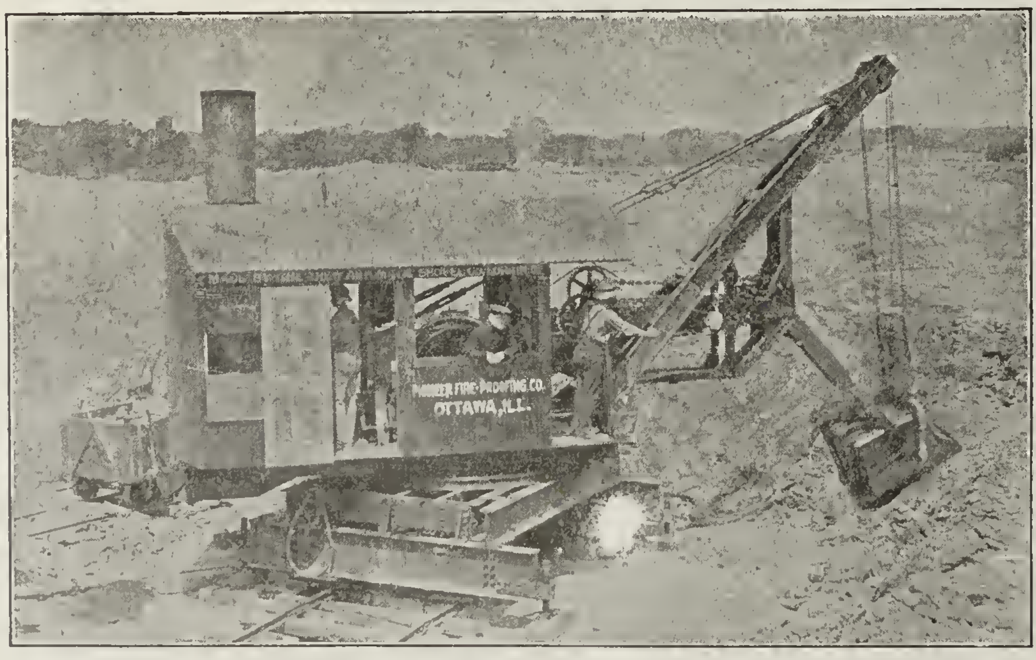
WASTE HEAT DRYER SPECIALISTS

303 Dearborn Street, *CHICAGO*

HANDLE YOUR CLAY WITH ONE MAN AND

The Thew Steam Shovels

Made In Four Sizes. Mounted on Car Wheels or Traction Wheels.



Type No. 2 Shovel—Pioneer Fireproofing Co., Ottawa, Ill.

Especially adapted for brickyard requirements. The shovel operates in a complete circle, enabling material to be delivered at side or in rear at will. The Dipper is hung from a horizontally moving carriage and can be adjusted to cut to any desired level.

: : **Only One Operator Required.**
Wire Cables used instead of Chains.
Strictly First-Class in Every Detail.

Economical for brickyards 30,000 to 40,000 daily capacity.

Operated by one man for outputs up to 125,000 brick per day.

Write us for Catalogues and Information.

THE THEW AUTOMATIC SHOVEL CO.,

LORAIN, OHIO.

A Perfect Clay Handling System.

We install our system and turn it over to you under guarantee of satisfactory results.

We do not shut your plant down while installing.

Our entire system is operated and controlled by ONE man at the hoist, and no horses, locomotives, or men required between bank and machine

Scarcely any power required.

We invite you to come and see a large plant in operation.

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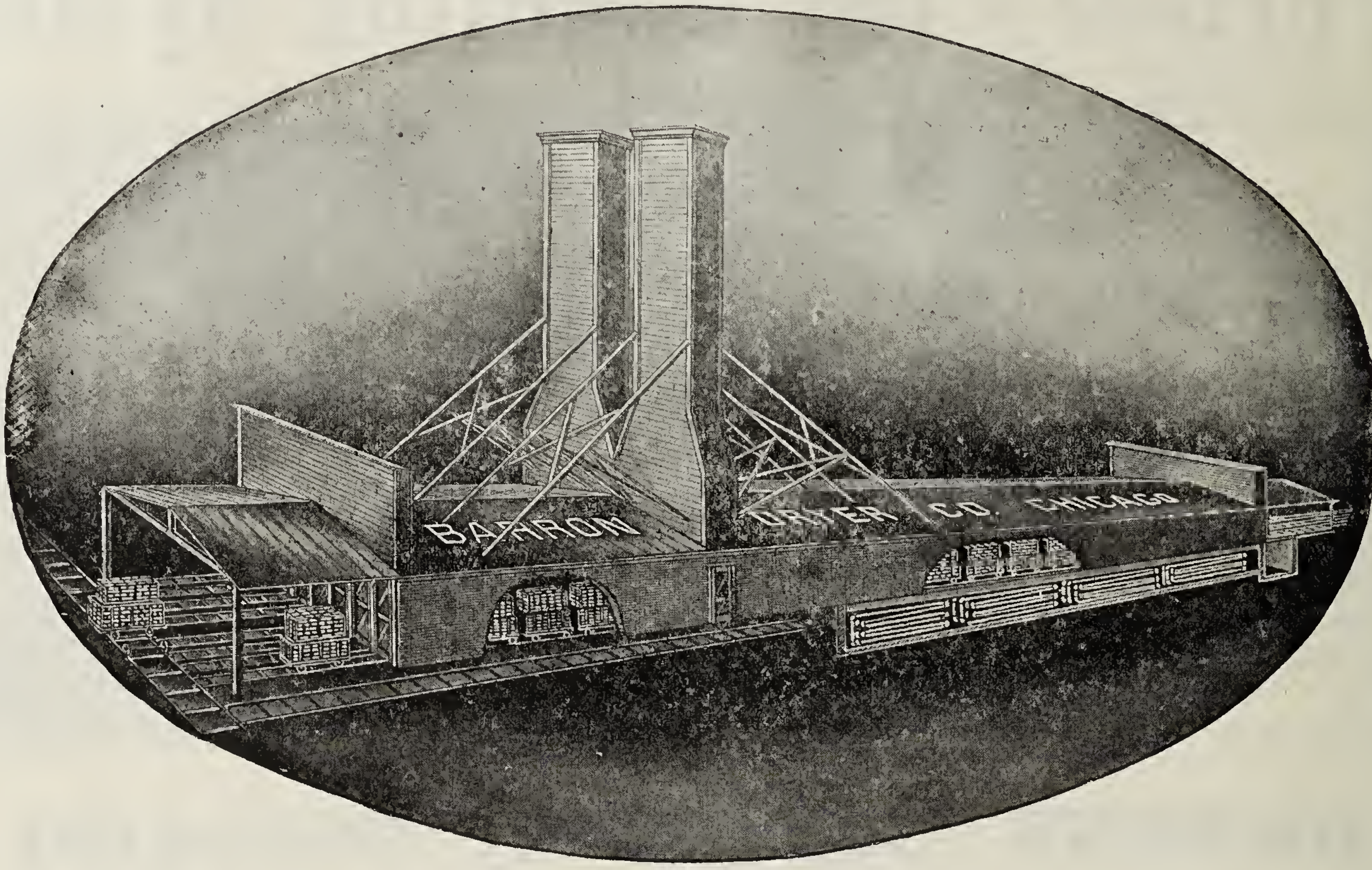

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You know that the brickmakers who are making the money in these days are those who have installed an up-to-date drying system enabling them to cope with ease with the heaviest demands of the market, their operations being uninterrupted all the year round.

This is true of them, what of your case? Why adhere still to antiquated methods subjected to weather limitations. Determine to install the most effective drying system in existence and apply for information and quotations to the

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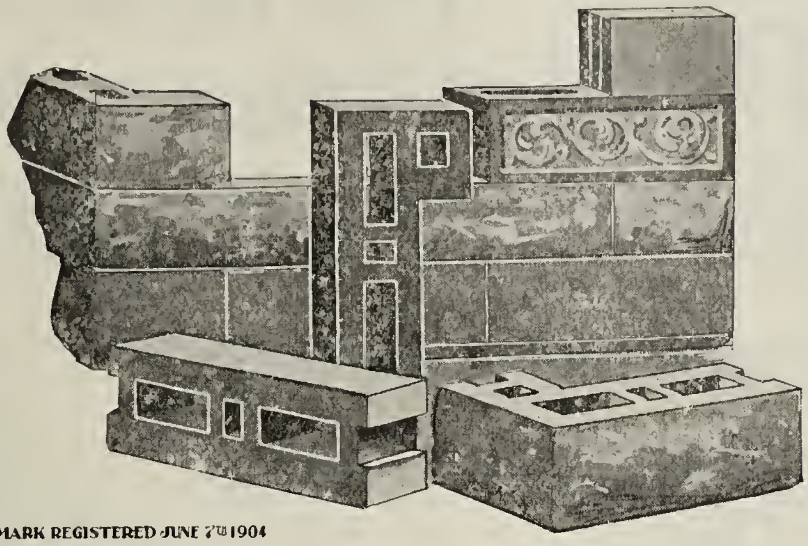

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BUILDING BLOCK COMPANY.

IT IS THE BEST BY EVERY TEST

ALL OF THESE POINTS ARE COVERED BY PATENTS TO US AND NO OTHERS. FOUR PARTIES HAVE ALREADY BEEN ENJOINED BY US IN UNITED STATES COURTS FOR INFRINGING OUR PATENTS.

Report infringing machines to Mr. Frank L. Wolfe, Two Rivers, Wis., Secretary National Organization of Cement Block Makers.

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It makes all lengths from **four** to **thirty-two** inches.

It makes all widths from **four** to **eighteen** inches.

It makes all heights from **one** to **nine** inches.

It makes all angles for **bay-windows.**

It makes blocks of different contour by removable face plates with patented designs.

It makes **joist** blocks and **nelting-courses.**

It was invented by a **practical** builder who knew what was necessary.

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It is not a cumbersome and bungling piece of mechanism.

Every block necessary to complete system of construction made by Palmer's machine. No waste.

Don't be deceived into buying a machine just because it makes a hole in a block. This is like poison to our business.

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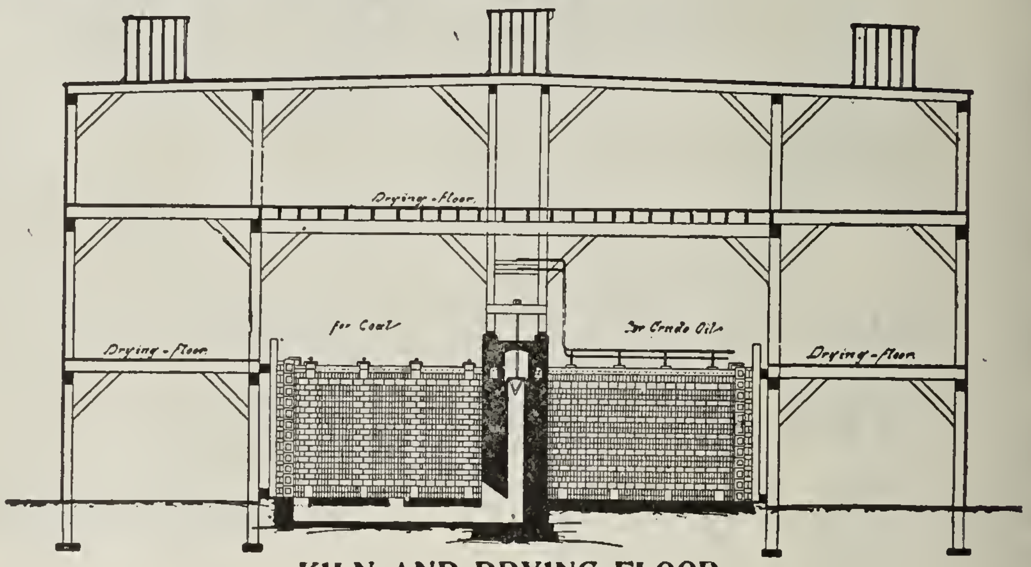
Lehmann Portable Continuous Kiln in Combination with Drying Floors...

CHEAPEST AND SIMPLEST CONTINUOUS KILN ON THE MARKET

Can be constructed ready for work in six to eight weeks, and adapted to all kinds of fuel. Saves 65 to 75 per cent. on fuel as compared with up-draft or down-draft kilns. Drying is done by heat escaping from kiln without extra expense, gradually, uniformly and thoroughly. Goods are handled by automatic delivery elevators, and cost of handling, drying and burning is reduced to a minimum.



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First successful attempt to burn Crude Oil in a Continuous Kiln; can be applied to any system.

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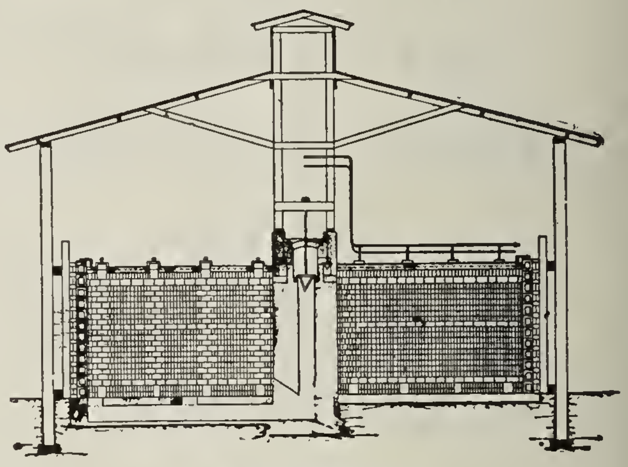
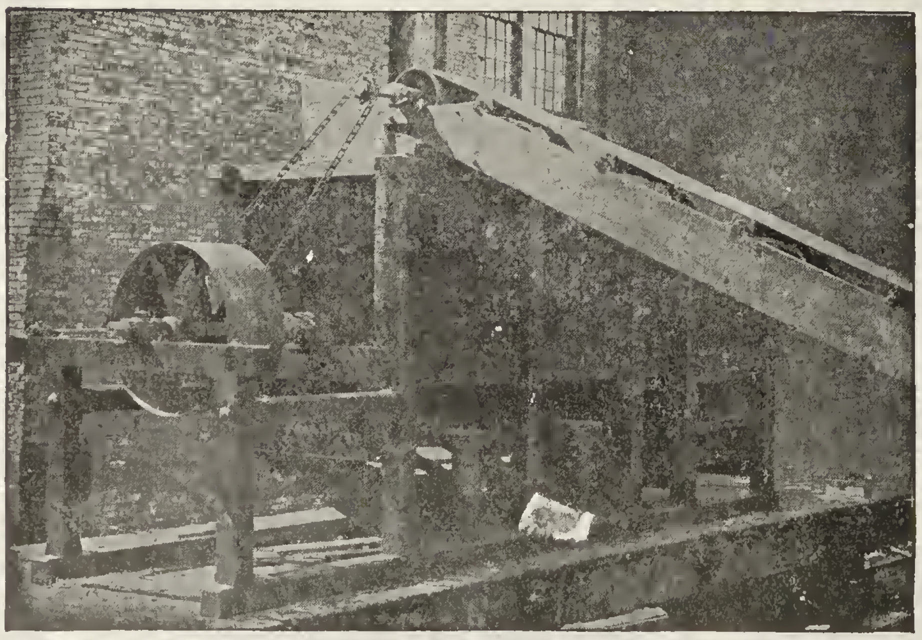
Can be made and adapted to any kind of clay at the place of manufacture, and insures uniformity of size of manufactured goods.



CONTINUOUS KILN



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MOST PRACTICAL, SIMPLE AND EFFECTIVE

The slumming process is the most economical and the only reliable method for removing gravel and other foreign matter from Common Clay, Kaolin, Chalk, Mineral Paints, etc.

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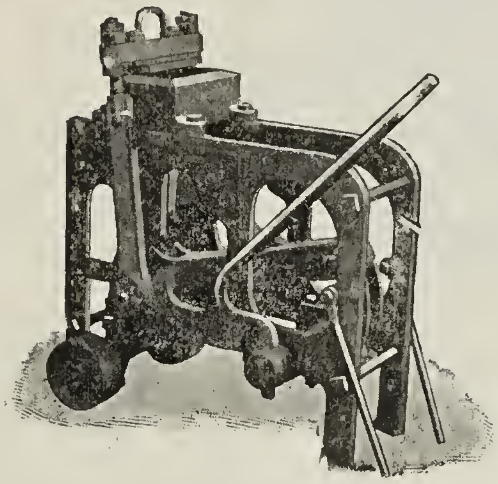
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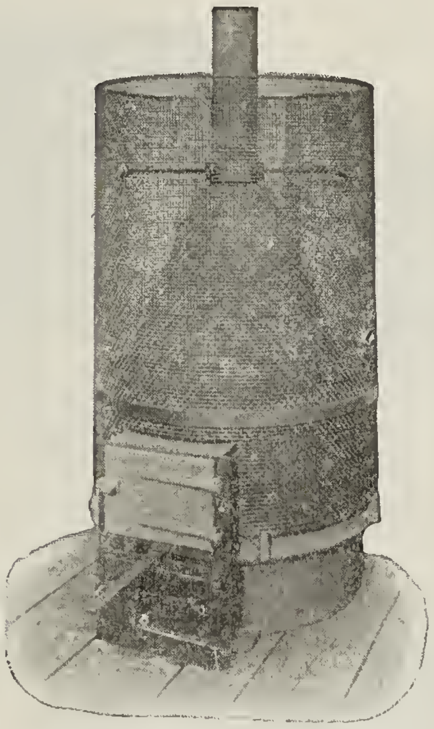
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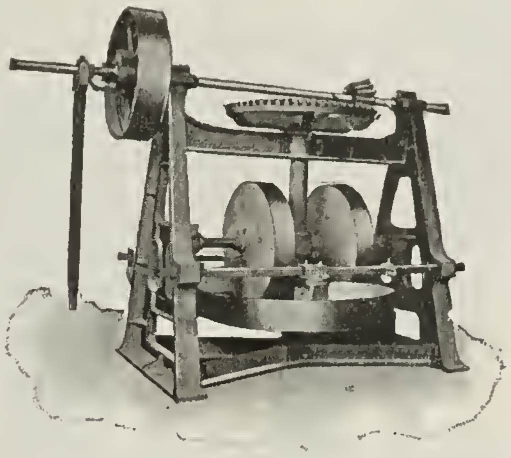
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That we are prepared to equip brick plants complete, including the brick machinery, dryers, engines, boilers; in fact, everything required to make good brick all ready for market.

We guarantee our machinery too.

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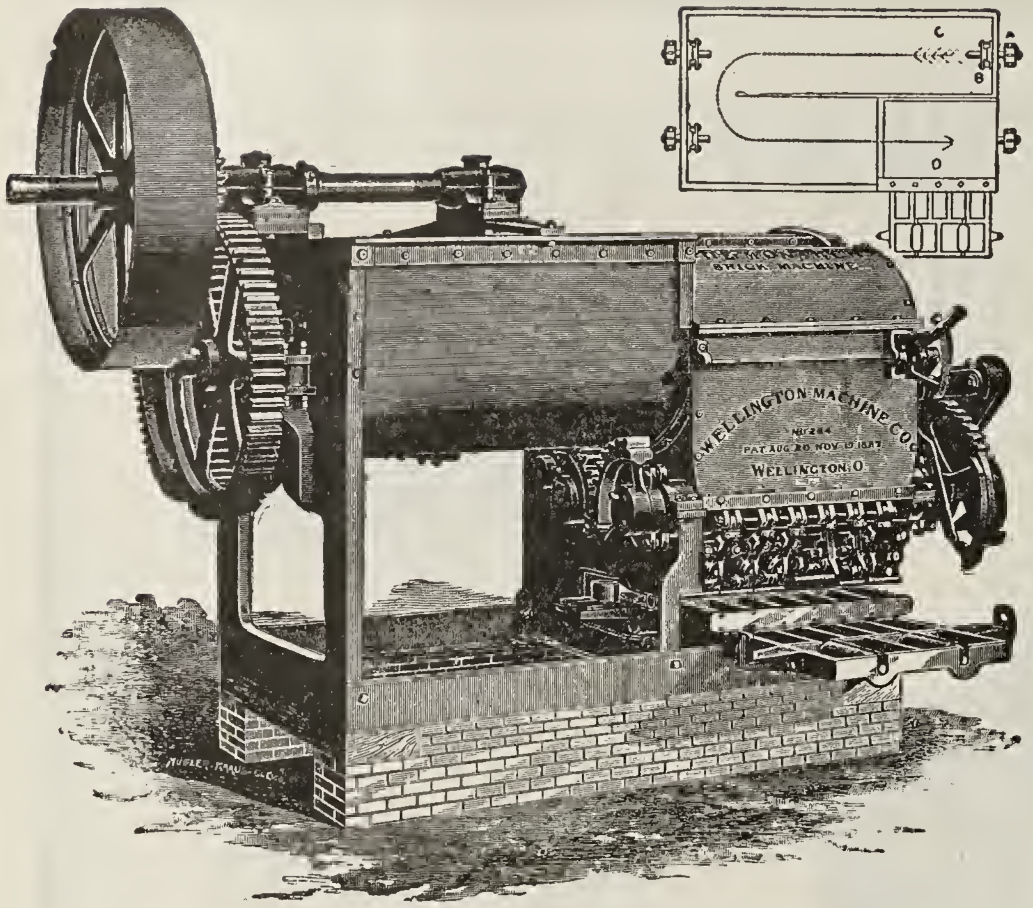
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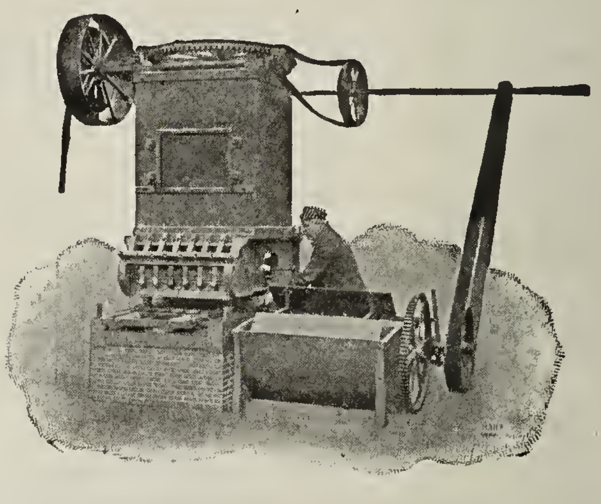

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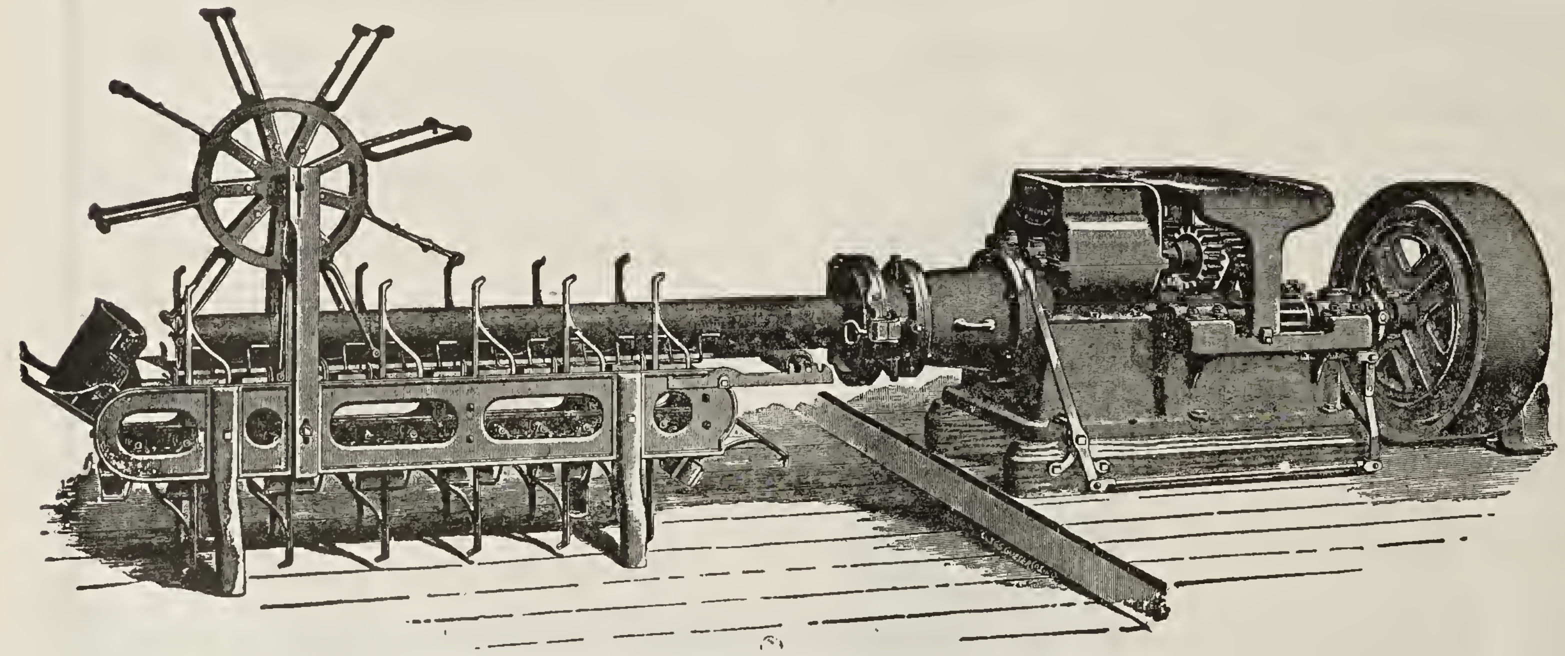

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"We Fulfill our Guarantees."

THE PREMIER BRICK MACHINE

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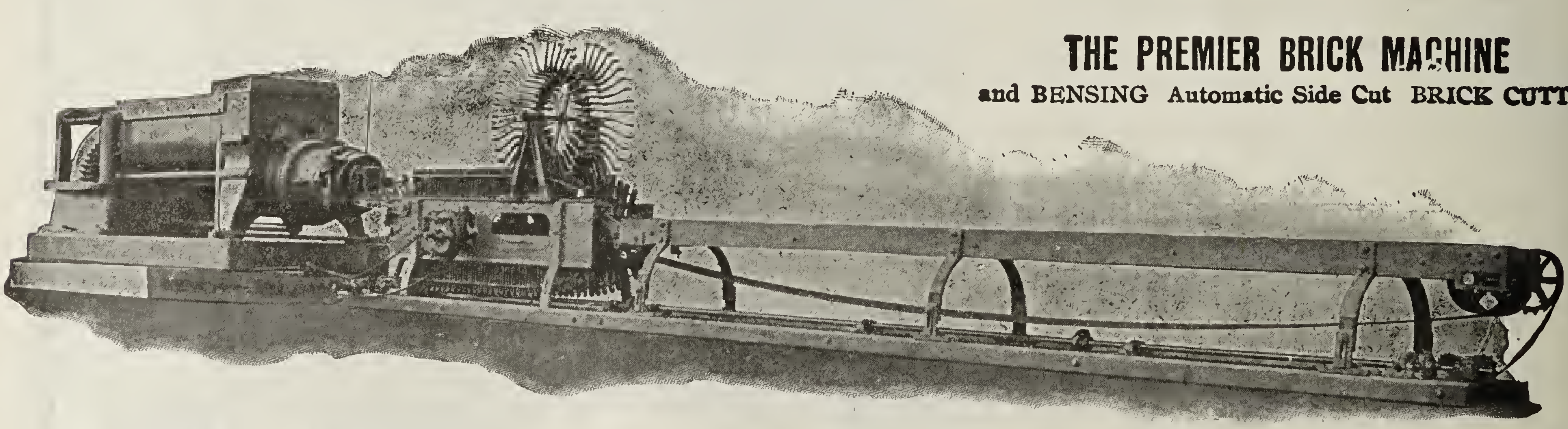

We have a full line of Clay-Working Machinery, sand mold brick machines, auger brick and tile machines, Automatic side and end cut tables, dies, molds, barrows, trucks, sanders, represses, pug mills. *The only down cut, reel side brick cutter on the market for cutting face brick that do not require repressing.* We can **guarantee to make** you a better face brick with this cutter than you can get from any other cutter on the market.

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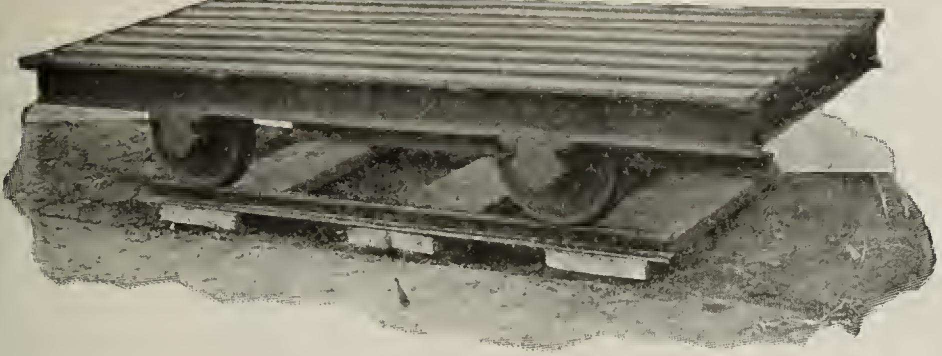

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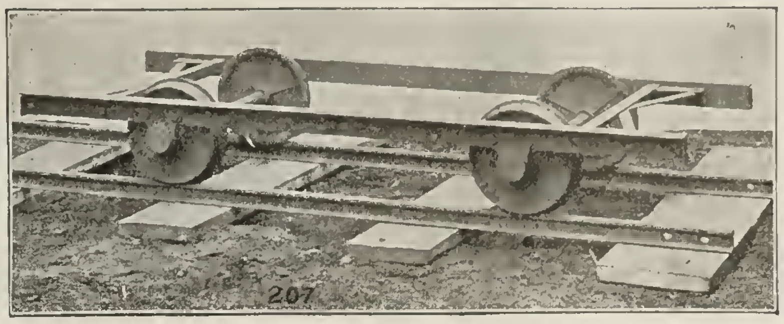

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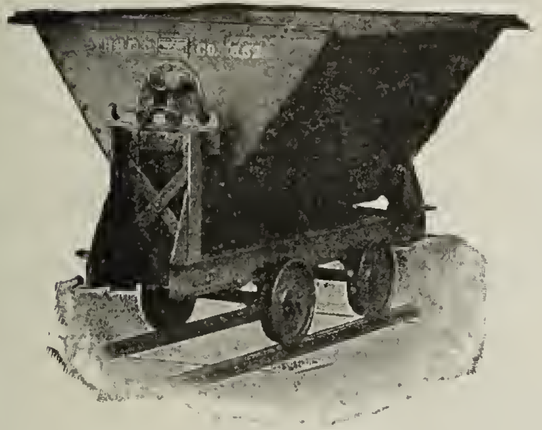

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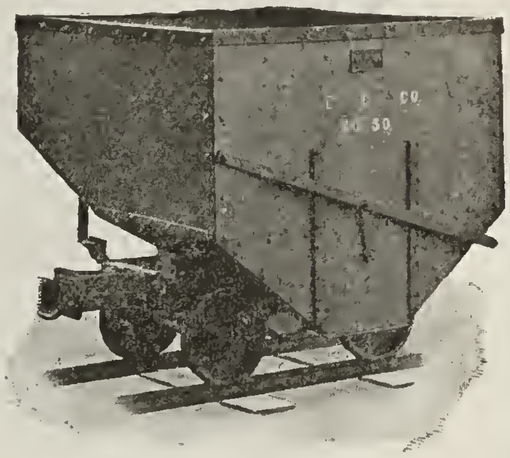

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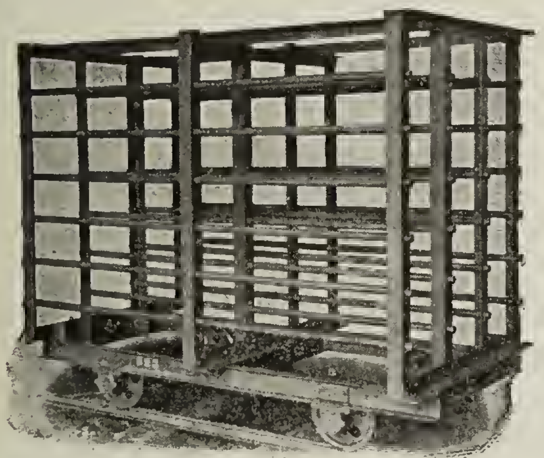

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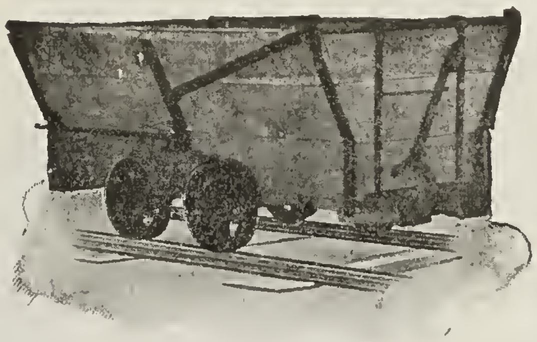

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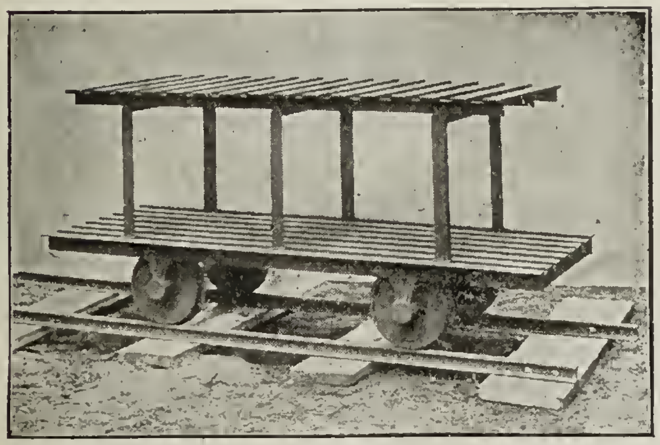

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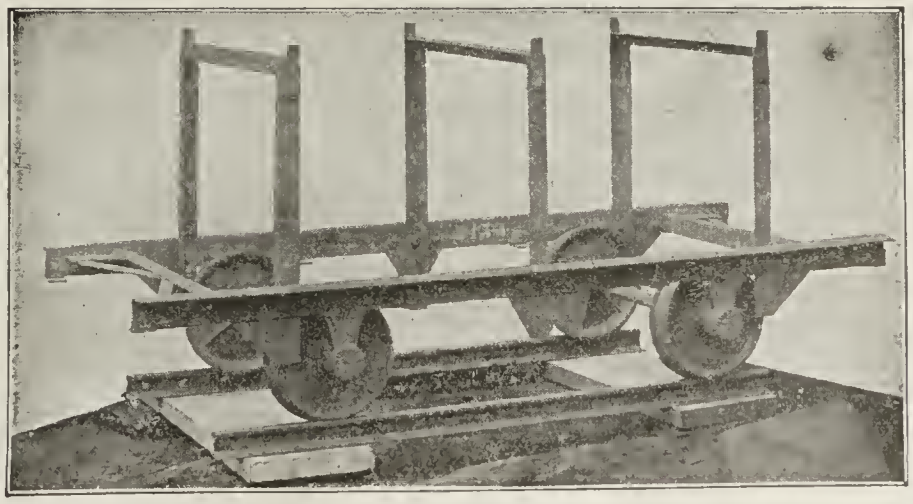

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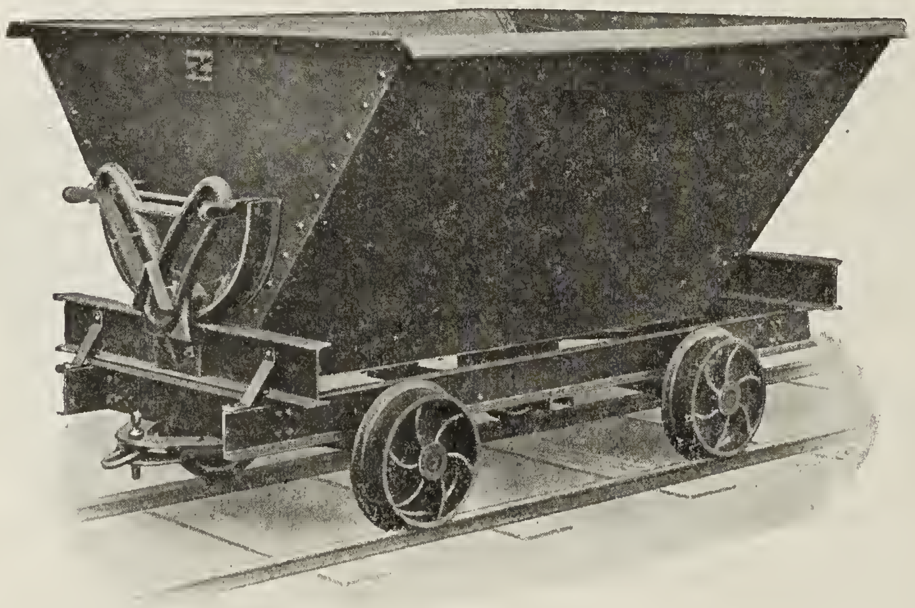
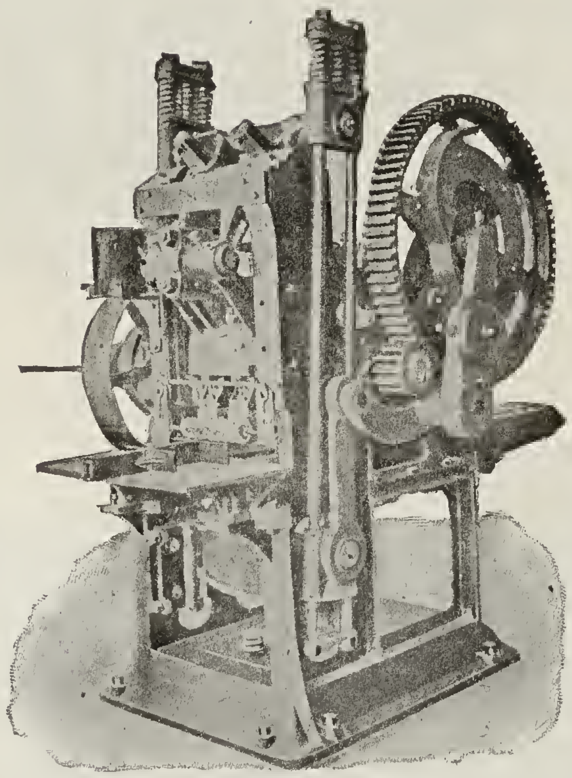


Clay Car.

If not, we can send some which we guarantee will be. They have no chains or pins to get lost or broken, cars cannot overdump, are self-locking, self-centering, easy running and durable.

We also build dryer cars of all kinds for all purposes.



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The Richardson Repress has all the features of merit that are demanded of a machine of this kind. Has enough depth of mold to make the largest size paving brick. All the working parts are above dies out of the way of waste clay. It has a slow pressing movement with double pressure, bringing out distinctly all markings and lettering. The working parts are adjustible to wear. It requires very little power and costs little to keep in repair.

Kindly write us for catalogs and full information.

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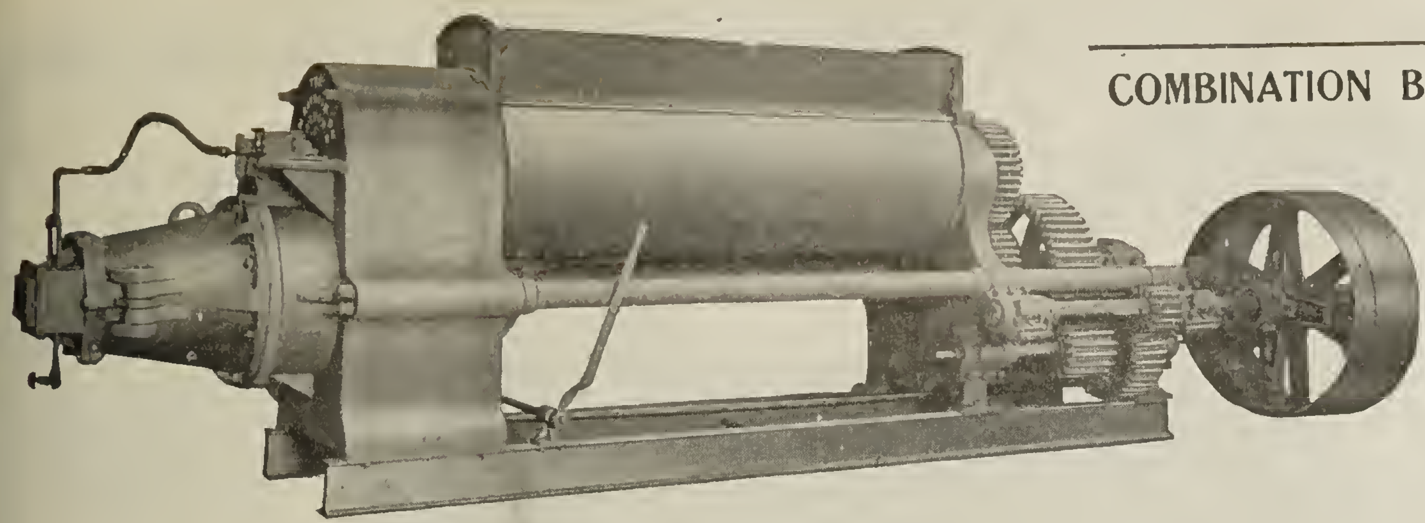

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Clay-Working Machinery

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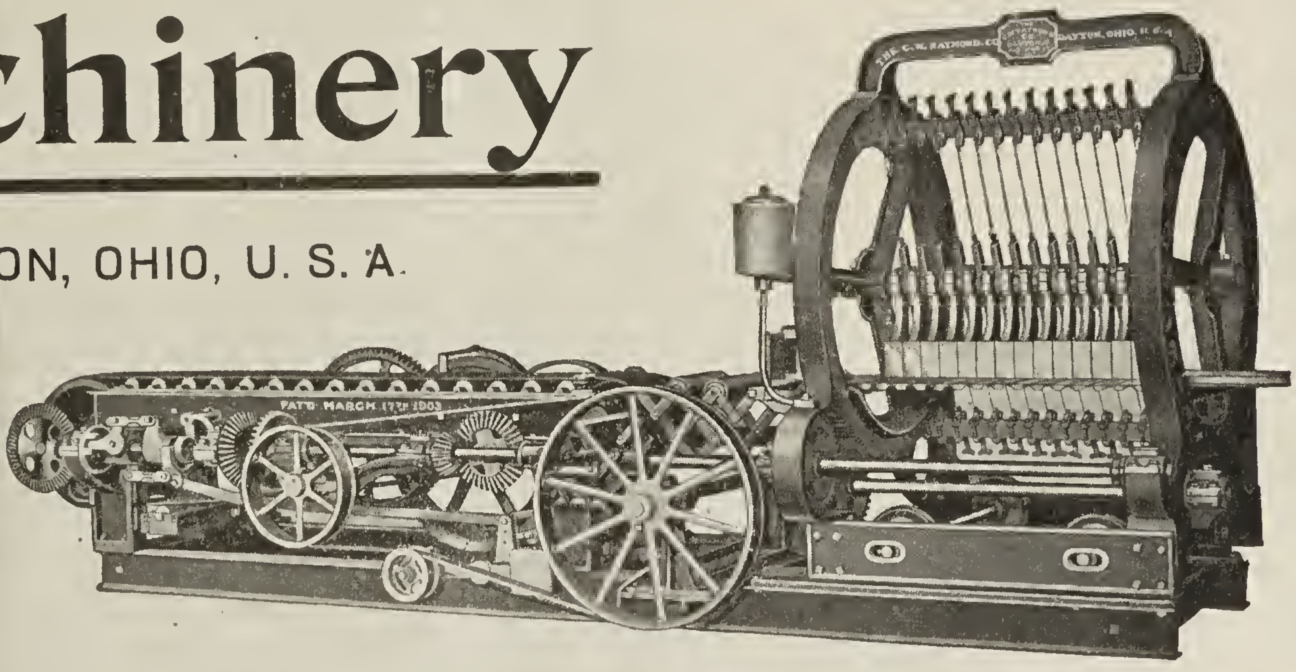
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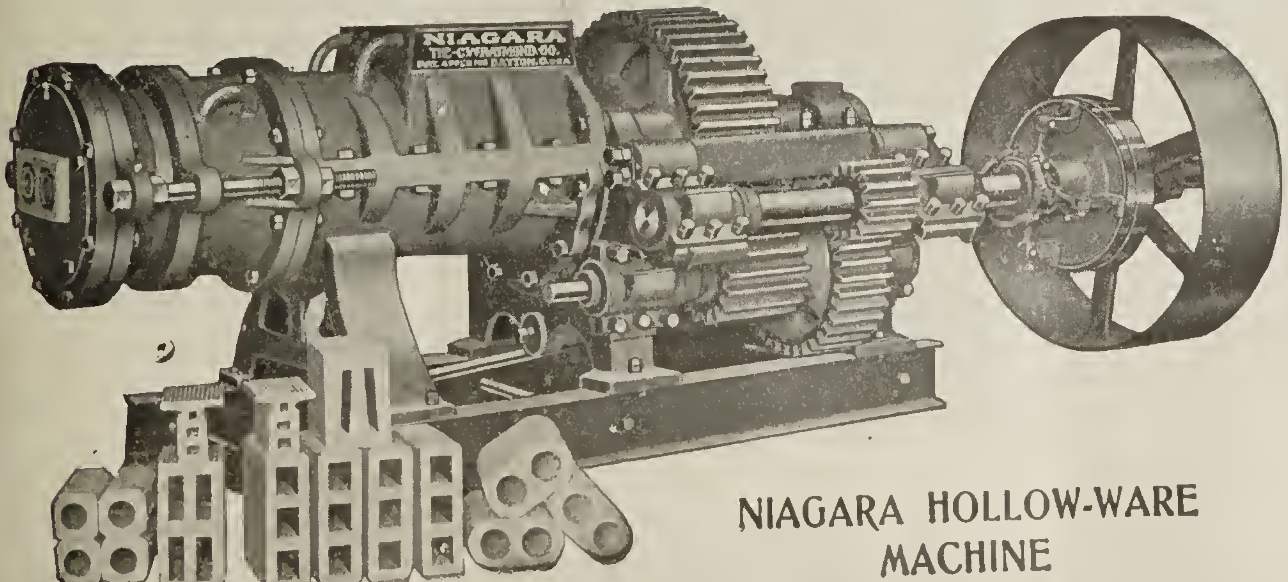
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Raymond Machinery
Creates New
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Better Brick
and more of them.

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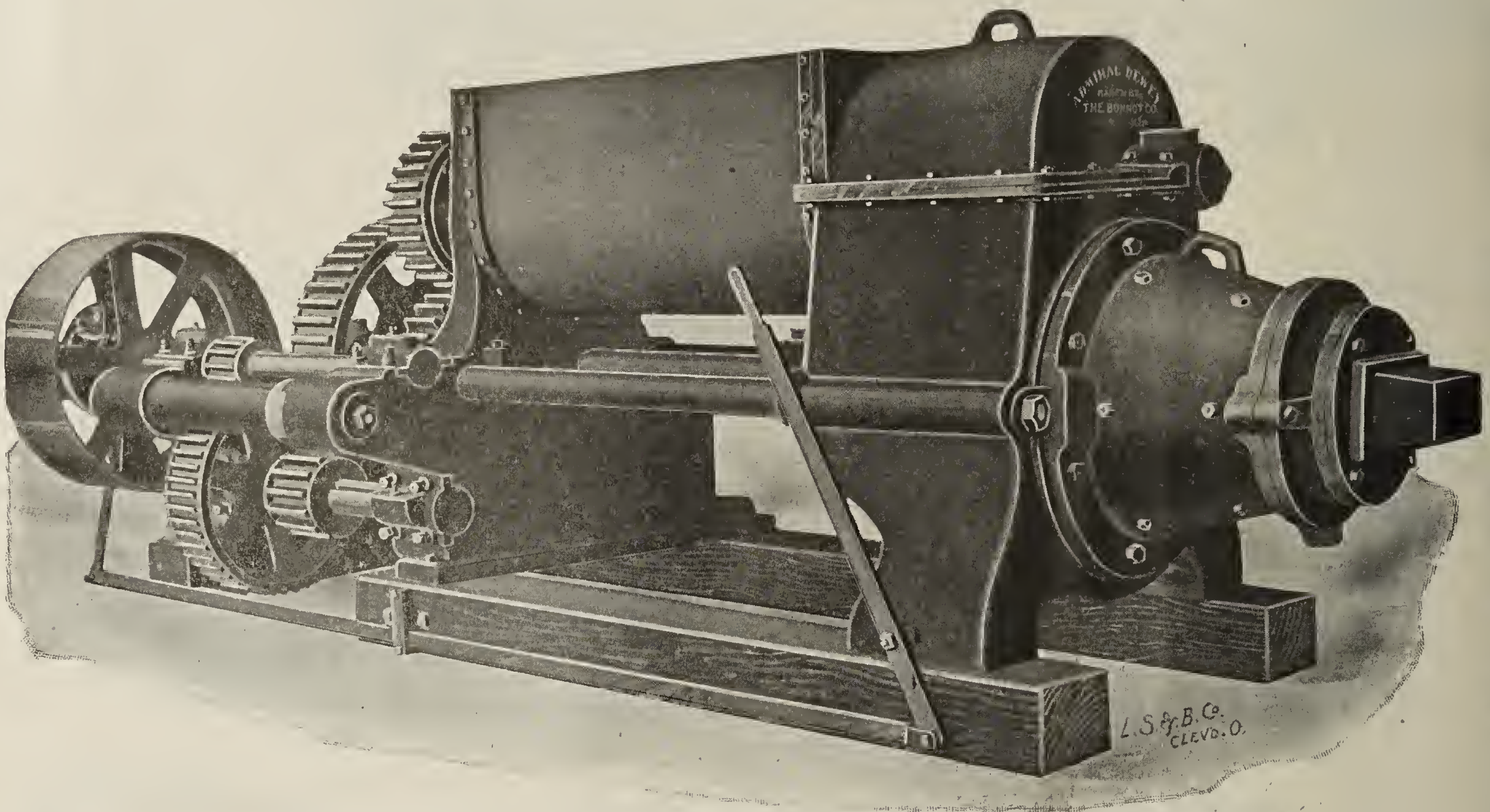
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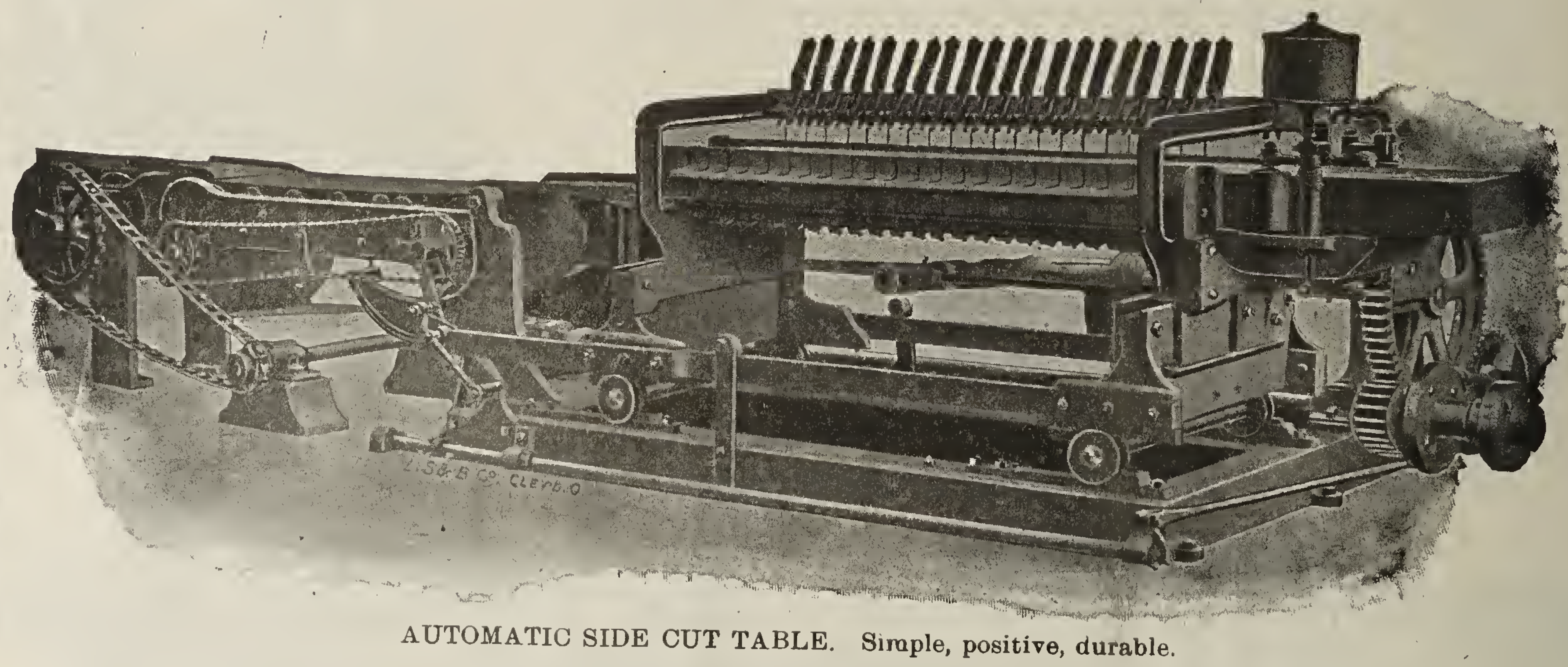
SPECIAL COMBINED BRICK MACHINE AND PUG MILL 100,000 daily capacity.
AUGER BRICK MACHINES 10,000 to 100,000 capacity, five sizes.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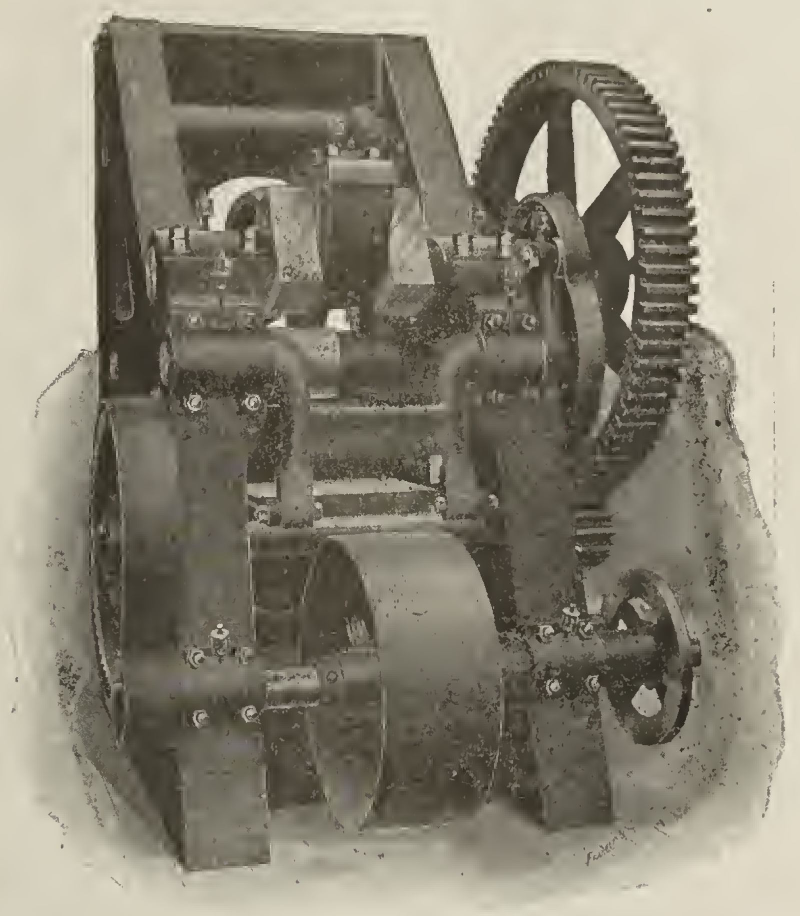
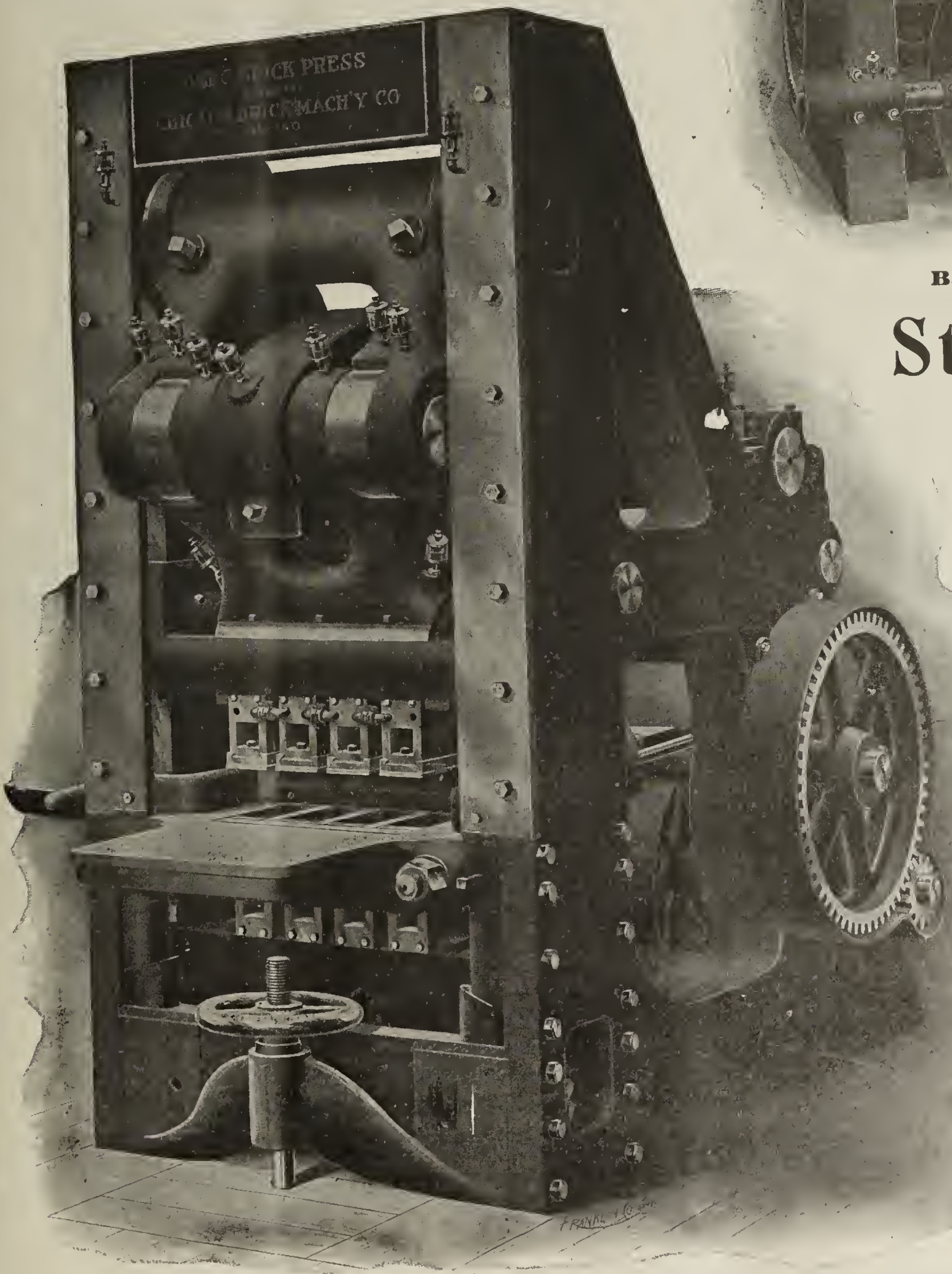


Back View.



Still in the Lead

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One Step Further Forward

Even stronger than ever and all self-contained. Greater pressure and fewer working parts than any other machine. Simple, massive, compact. Running mechanism placed in rear, as shown in upper cut, enabling this machine to be SHIPPED IN ONE PIECE.

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ANDERSON FOUNDRY & MACHINE WORKS
Anderson, Indiana.

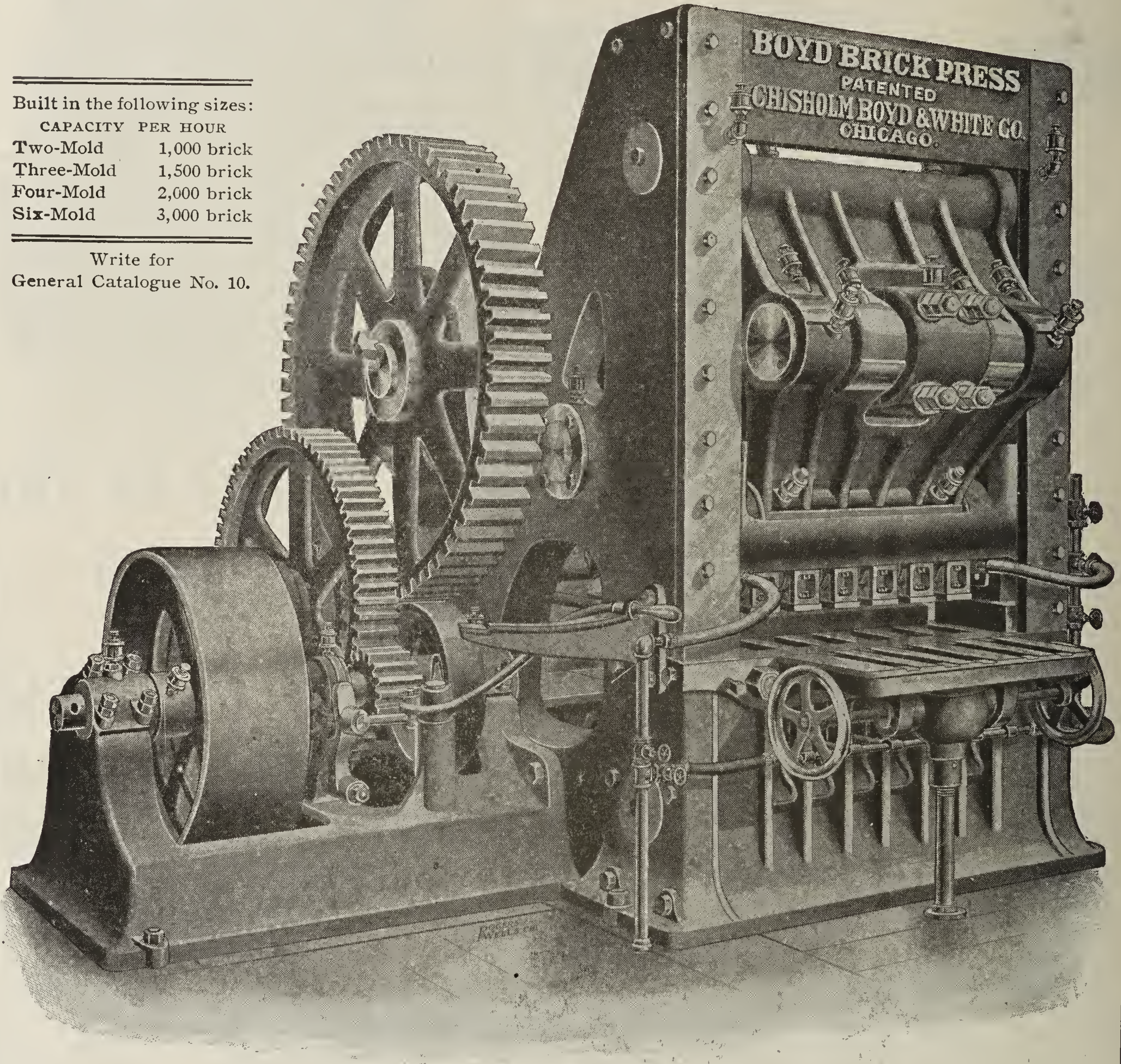
SOLD BY
CHICAGO BRICK MACHINERY COMPANY
77 Jackson Boulevard, Chicago.

The Boyd Brick Press

Built in the following sizes:

	CAPACITY PER HOUR
Two-Mold	1,000 brick
Three-Mold	1,500 brick
Four-Mold	2,000 brick
Six-Mold	3,000 brick

Write for
General Catalogue No. 10.



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Six of our SIX-MOLD PRESSES in use on ONE YARD since 1892. Average cost of repairs for each machine One Dollar per year.

THE BOYD PRESS has always been distinguished for originality in design and construction. It will make better brick from clay or shale than can be made from the same material by any other press. It is selected and purchased by the most progressive Brick Makers. The largest and most successful brick plants in the country are using Boyd Presses.

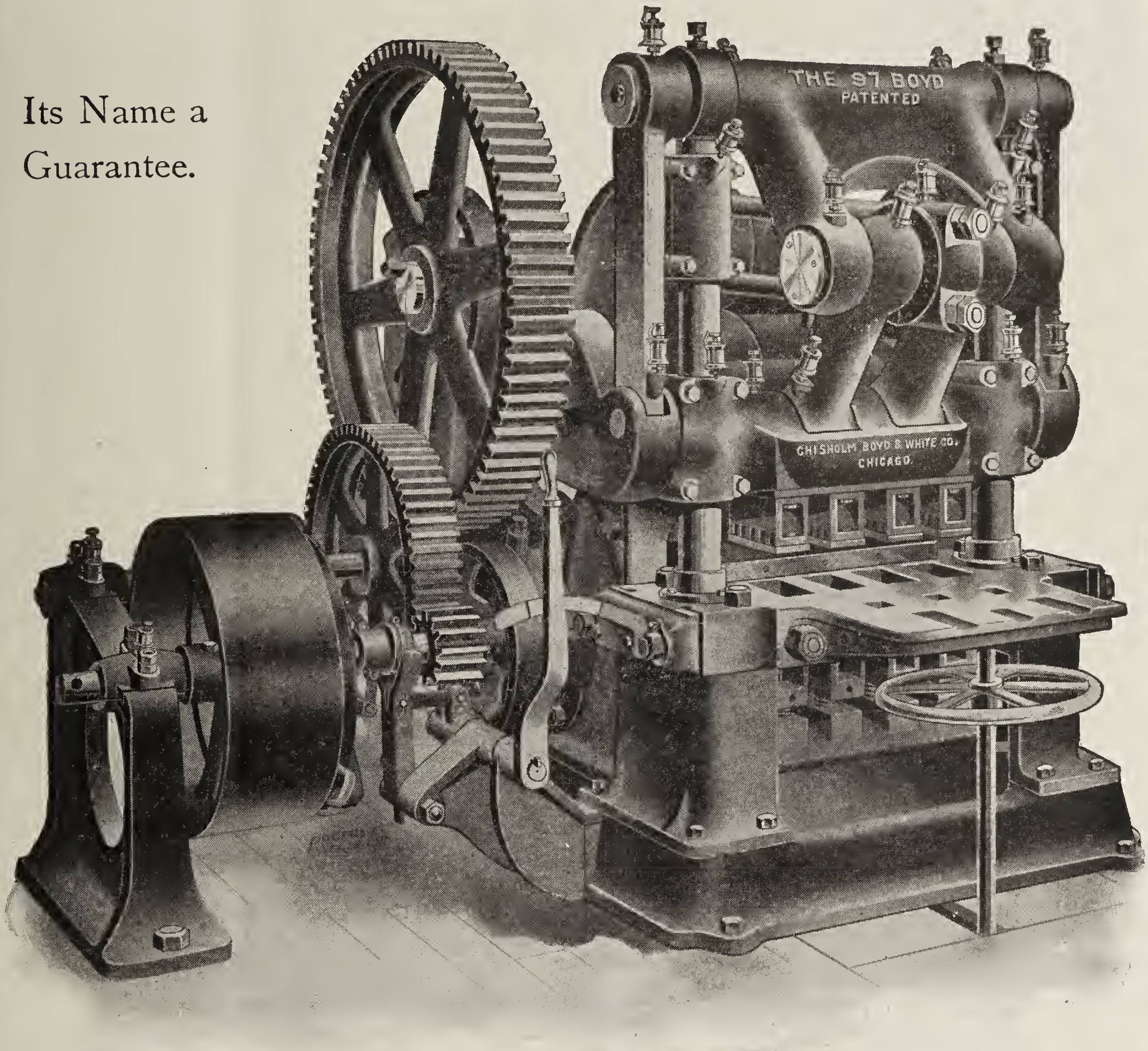
Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. **CHICAGO, ILL.**

The Boyd Brick Press

The '97 Model

Its Name a
Guarantee.



THE '97 MODEL BOYD BRICK PRESS has enormous strength and great durability; it is compact; the adjustments are convenient; it operates quietly and smoothly; the workmanship and material are of the best; the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking.

THE BOYD is the only Brick Press provided with an independent adjusting device for regulating the amount of clay in the molds and the pressure on the brick. This feature positively ensures equal pressure and finish on both sides of the brick, and no granulated or soft centers.

Sent on trial and fully guaranteed. Seventy presses of this pattern now in use. Cannot be broken in pressing brick. Write for descriptive catalogue No. 9.

Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

Adopted and Purchased by the United States Government for use in the Federal Prison at Ft. Leavenworth, Kansas.

Ross-Keller Triple Pressure Brick Machine Co.

SOLE MANUFACTURERS OF THE

"ROSS-KELLER" TRIPLE PRESSURE BRICK MACHINE
"ROSS-KELLER" 44-INCH DISINTEGRATOR

OFFICES:
FULLERTON BUILDING

THIS PRESS HAS AN UNEQUALLED RECORD IN THE MANUFACTURE OF SAND - LIME BRICK.

St. Louis, Mo., U. S. A., March 15th, 1905.

ANNOUNCEMENT

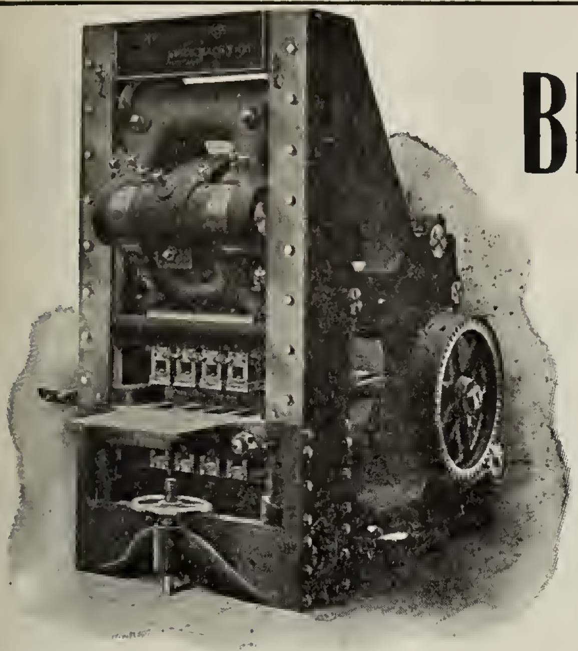
To meet the demand for a lighter ROSS-KELLER Press than our Triple Pressure Standard Machine, we have designed and are now building a high-grade four-mould press, weight 30,000 pounds, which we recommend to the trade for clays and soft shales, which do not require as great a pressure as is secured in operating our Standard Machine.

Our Standard Triple Pressure Machines (weight 42,000 pounds) are now being successfully operated on Clay, Shale, Sand-Lime and Cement Brickyards, and lead all other Dry Presses on the market. We have a number of these machines now in process of manufacture, and are in a position to make prompt deliveries.

We guarantee both types of machines to be strictly high-grade, and are prepared to make satisfactory prices and terms to manufacturers who are in the market for a dry dress.

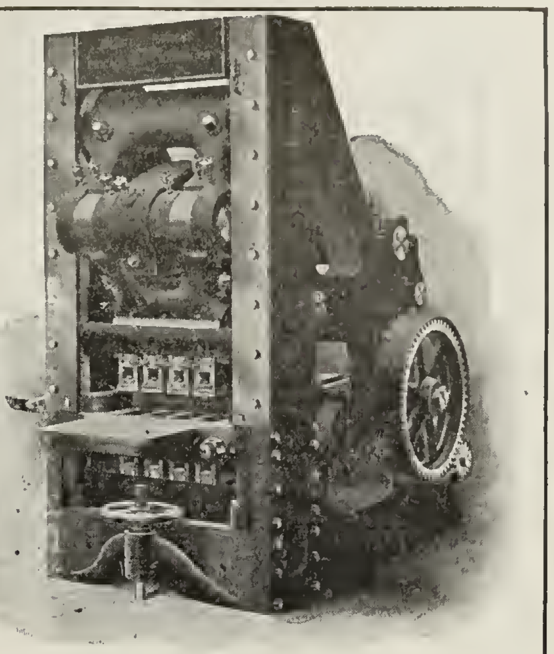
We invite correspondence.

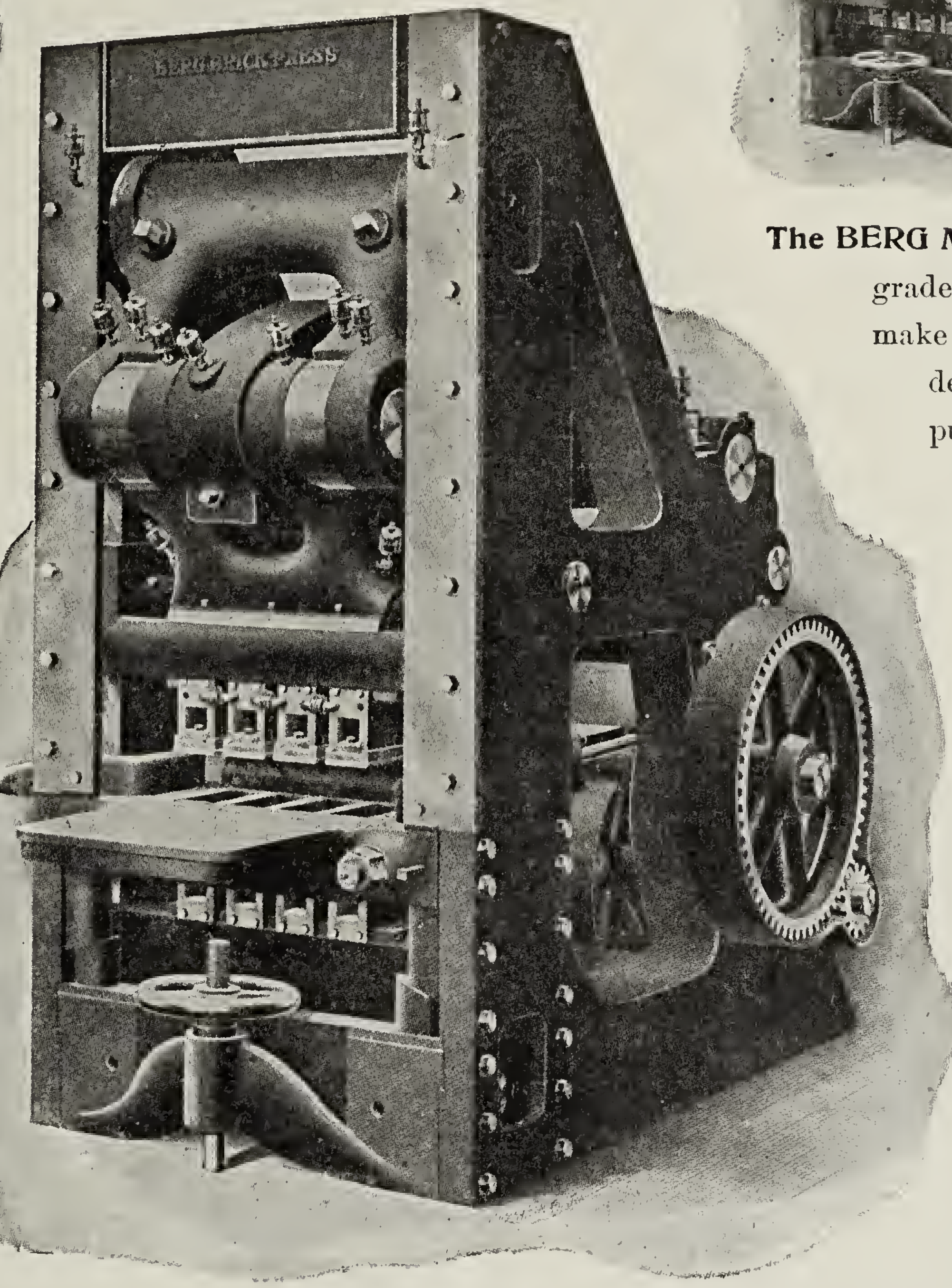
Ross-Keller Triple Pressure Brick Machine Co.
FULLERTON BUILDING, ST. LOUIS, MO



BERG BRICK PRESS

The highest development of the Art of Brickmaking Machinery so pronounced by the United States Government.





The BERG for the highest grade of pressed brick of shale or clay. It makes all kinds of shapes and sizes of brick. Changes from one shape to another can be made in less than an hour's time.

First-Class Workmanship. Cut Gearing. Fully Warranted.

The BERG makes the best sand-lime brick and cheapest because it is the strongest machine and gives the highest pressure. Thirty-five sand-lime plants in United States use the **BERG** Brick Press SUCCESSFULLY.

The BERG MAKES the highest grade of fire brick. Can make all kinds of shapes desired for fire-brick purposes.

Three distinct pressures make the brick evenly pressed all through. No granulated centers of the brick.

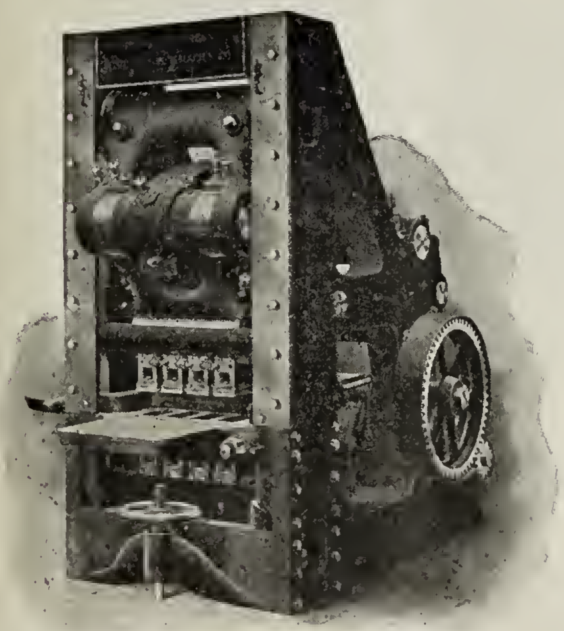
The BERG is the best for sand and cement because of its strong pressure. Uses less cement, makes cheaper brick.

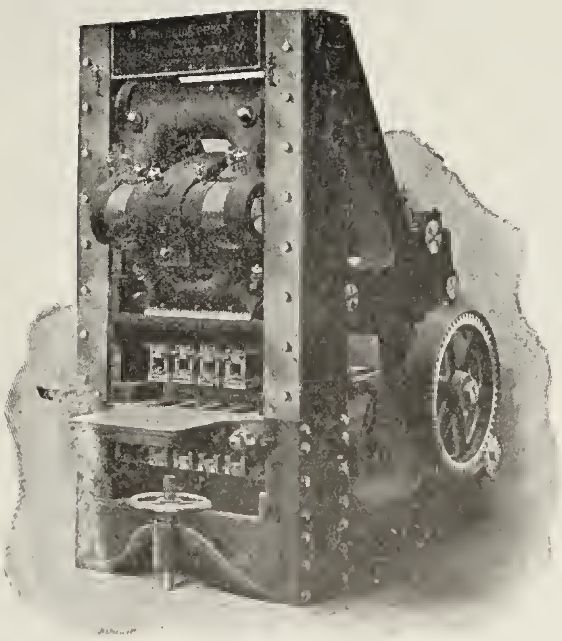
The 1905 Berg Press

Many other steps further forward in improvement and highest grade of material and workmanship, also cut gearing. Fully guaranteed as to its success. Manufactured by its inventor in Toronto, Canada, at the Bertram Engine Works Co. Plans and specifications on the different kinds of plants furnished, also all equipments.

For prices and full particulars, address

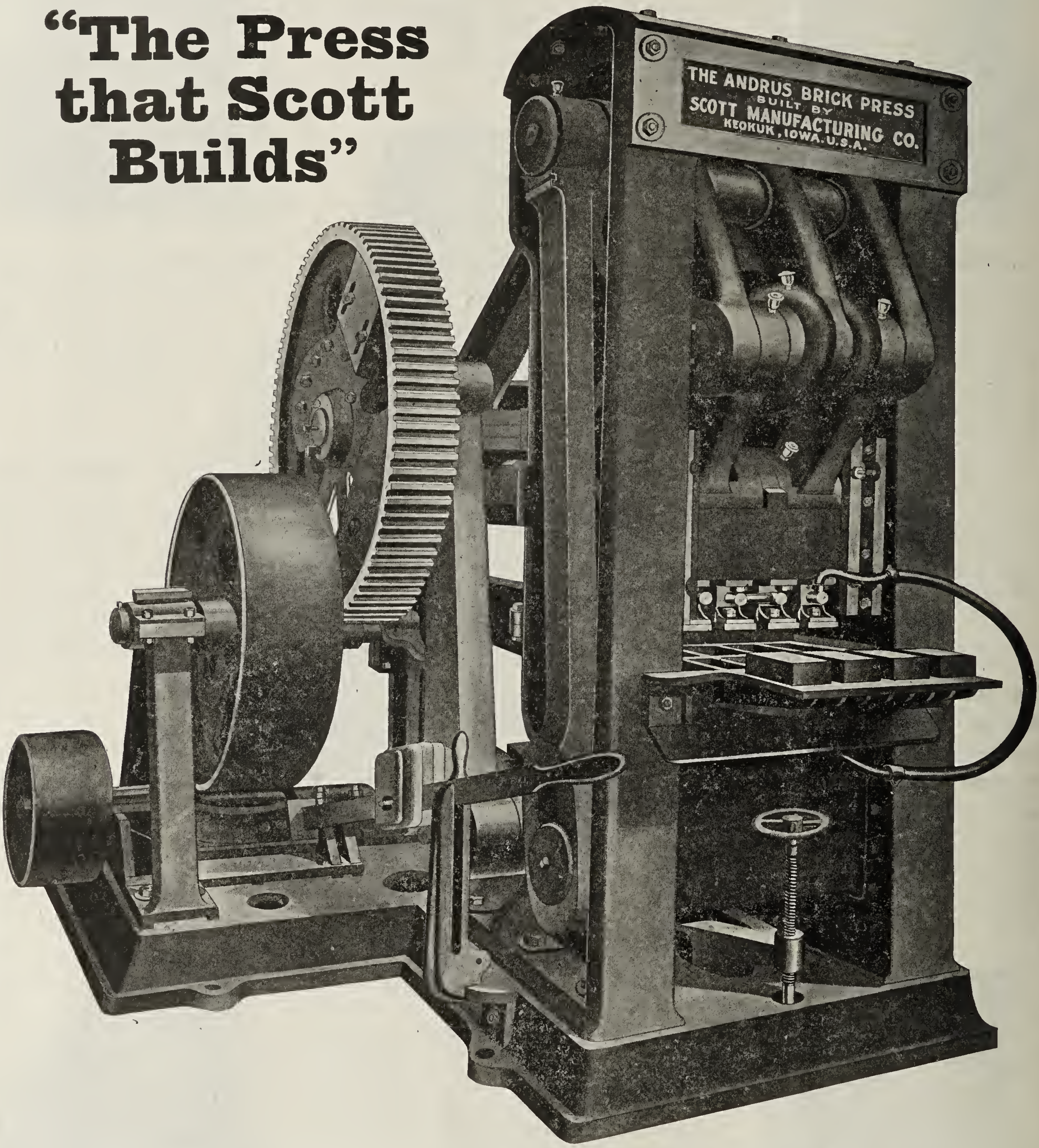
A. BERG
THE BERTRAM ENGINE WORKS
Toronto, Ontario, Canada





One Glance Ought To Convince You

"The Press that Scott Builds"



"Makes Brick every day" because it never takes time to lay up for repairs.

SCOTT MANUFACTURING COMPANY

Works: Keokuk, Iowa. *ST. LOUIS, MO.*

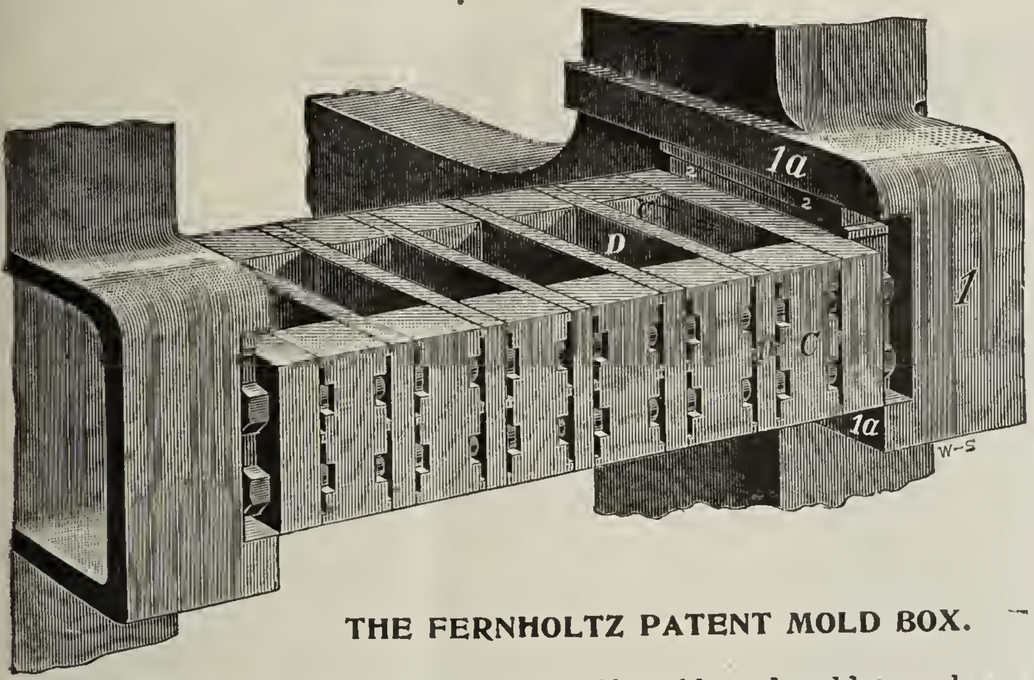
Call and see us in our new office, 609-610 Commonwealth Trust Building.

THE FERNHOLTZ BRICK MACHINERY CO.

Manufacturers of

The Celebrated Fernholtz Dry Press

Four mold Press 20,000 daily capacity. Six'mold Press 30,000 daily capacity

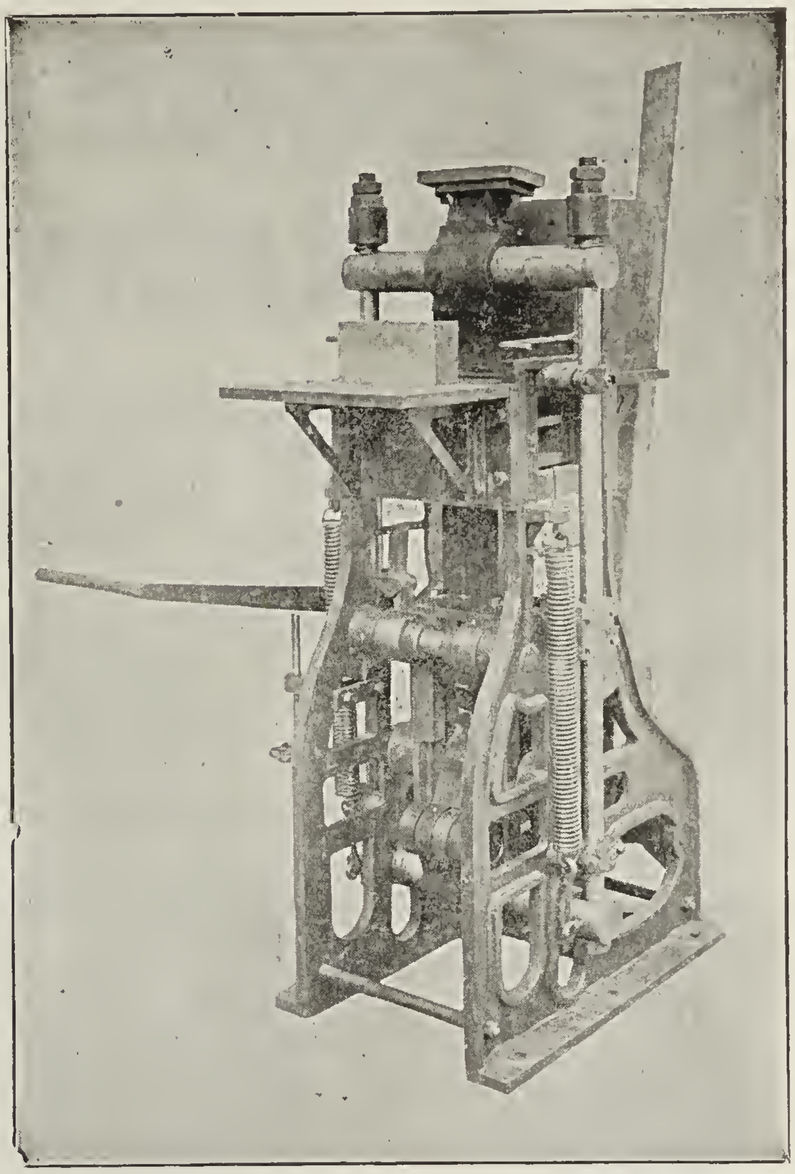


THE FERNHOLTZ PATENT MOLD BOX.

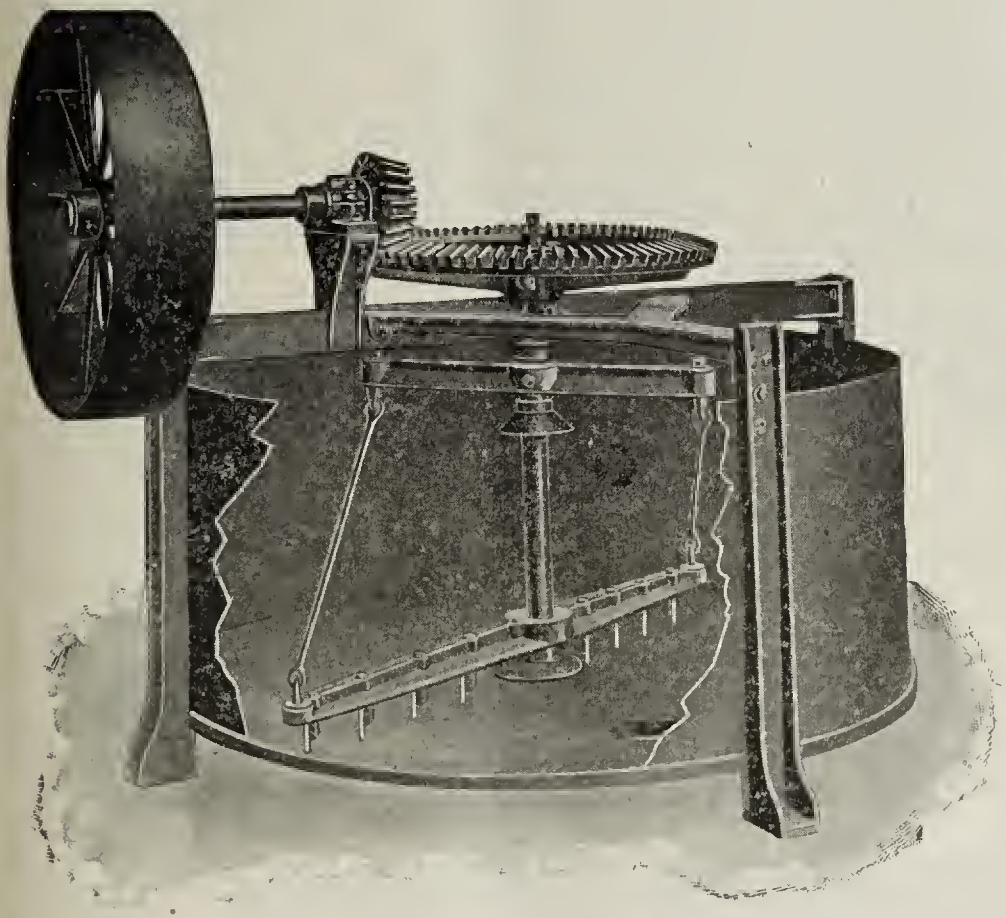
No old style Liners. The Blocks are adjustable and molds are always one size. We have put them in most all makes of Dry Press machines. Easily and quickly adjusted. They are made entirely out of chilled iron, the hardest known metal.

GRATH PATENT HAND POWER PRESS.

Especially adapted for ornamental designs Any size brick up to 12⅝ inches long, 10 inches wide and 4¼ inches thick.
Brick set into kiln direct from press.



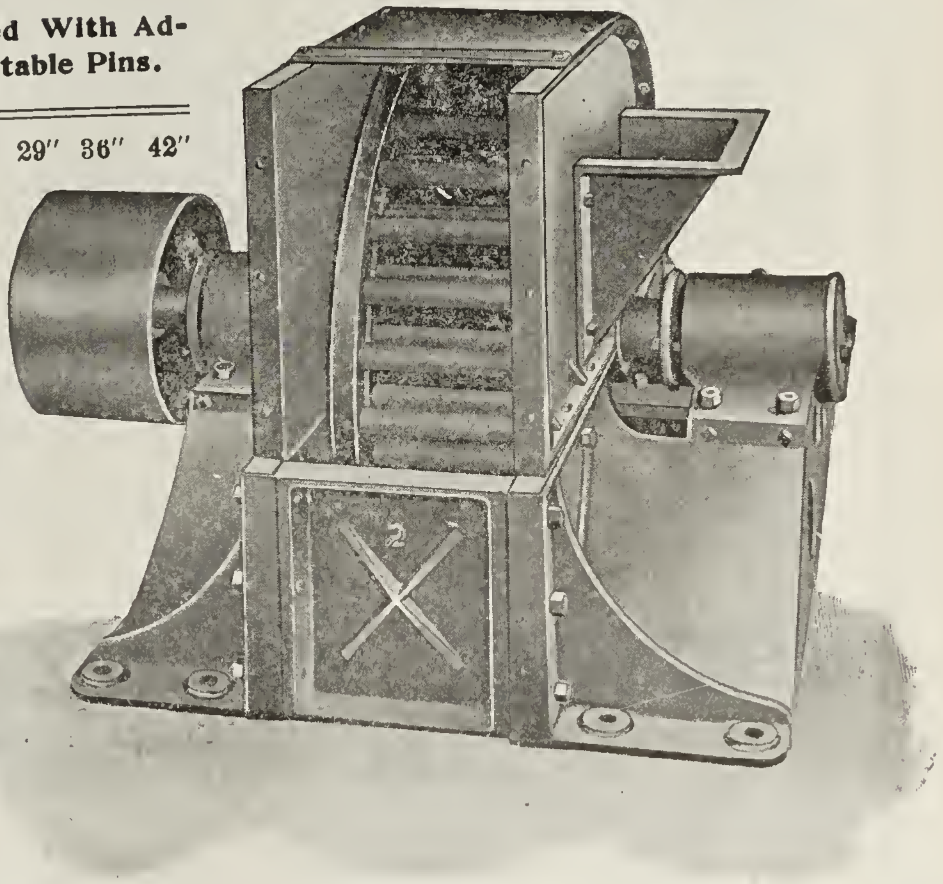
GRATH PATENT HAND POWER PRESS.



A GOOD MIXER IS ALWAYS APPRECIATED.

Fitted With Adjustable Pins.

Sizes 29″ 36″ 42″



THE FERNHOLTZ CLAY PULVERIZER.

The Fernholtz Brick Machinery Co.

Cable Address "Fernbrick." Western Union Code.

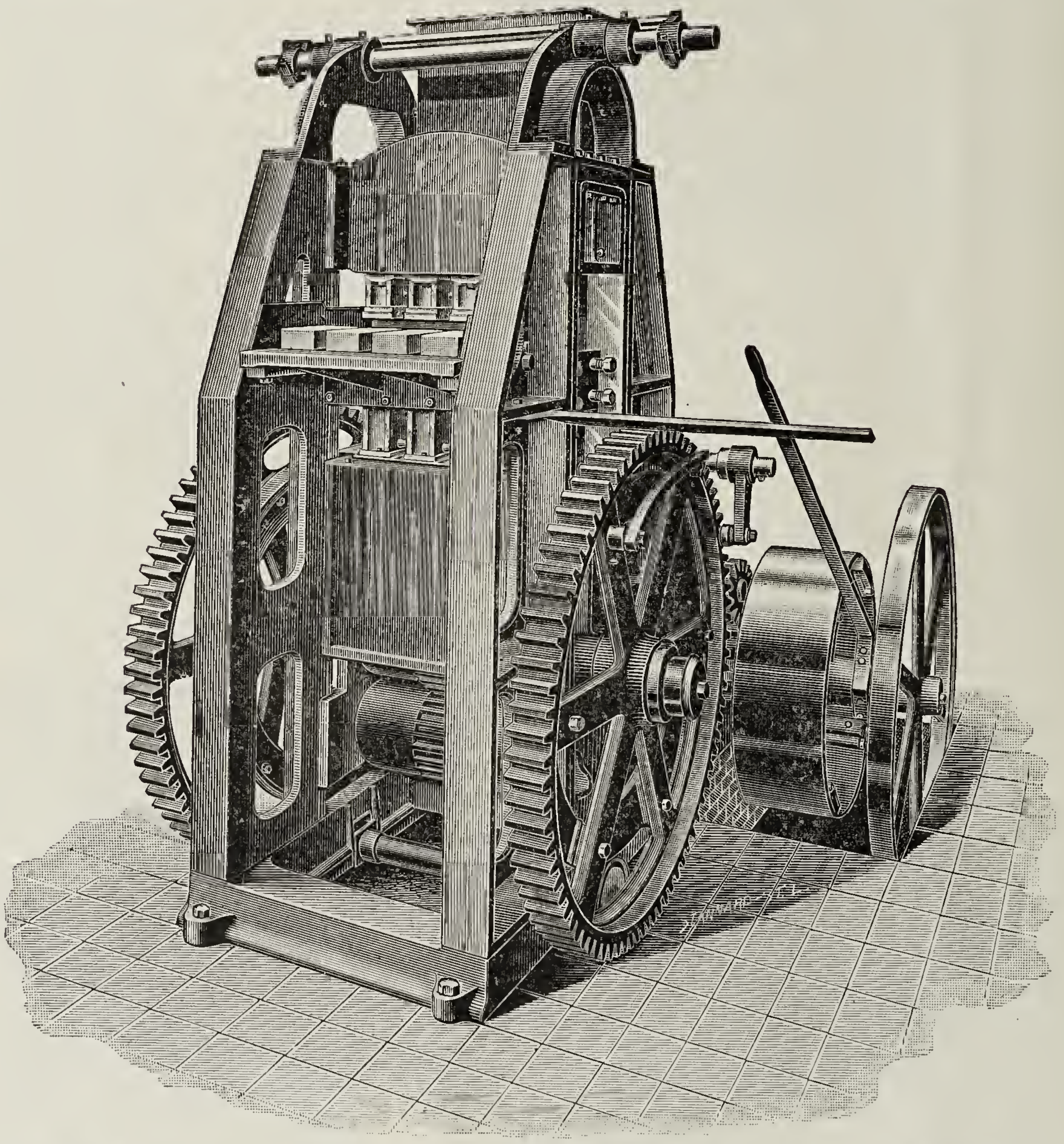
Boyle Avenue and Old Manchester Road, ST. LOUIS, MO., U. S.A.

PERFECTION REALIZED

IN THE

RELIANCE DRY PRESS BRICK MACHINE

(PATENTED)



Main
Features:
Strength
Durability
Simplicity
Saves Fuel
and
Costs Less

No
Toggles
No
Links
No
Pins
to
Wear

STRONGEST AND MOST POWERFUL BRICK PRESS
ON THE MARKET

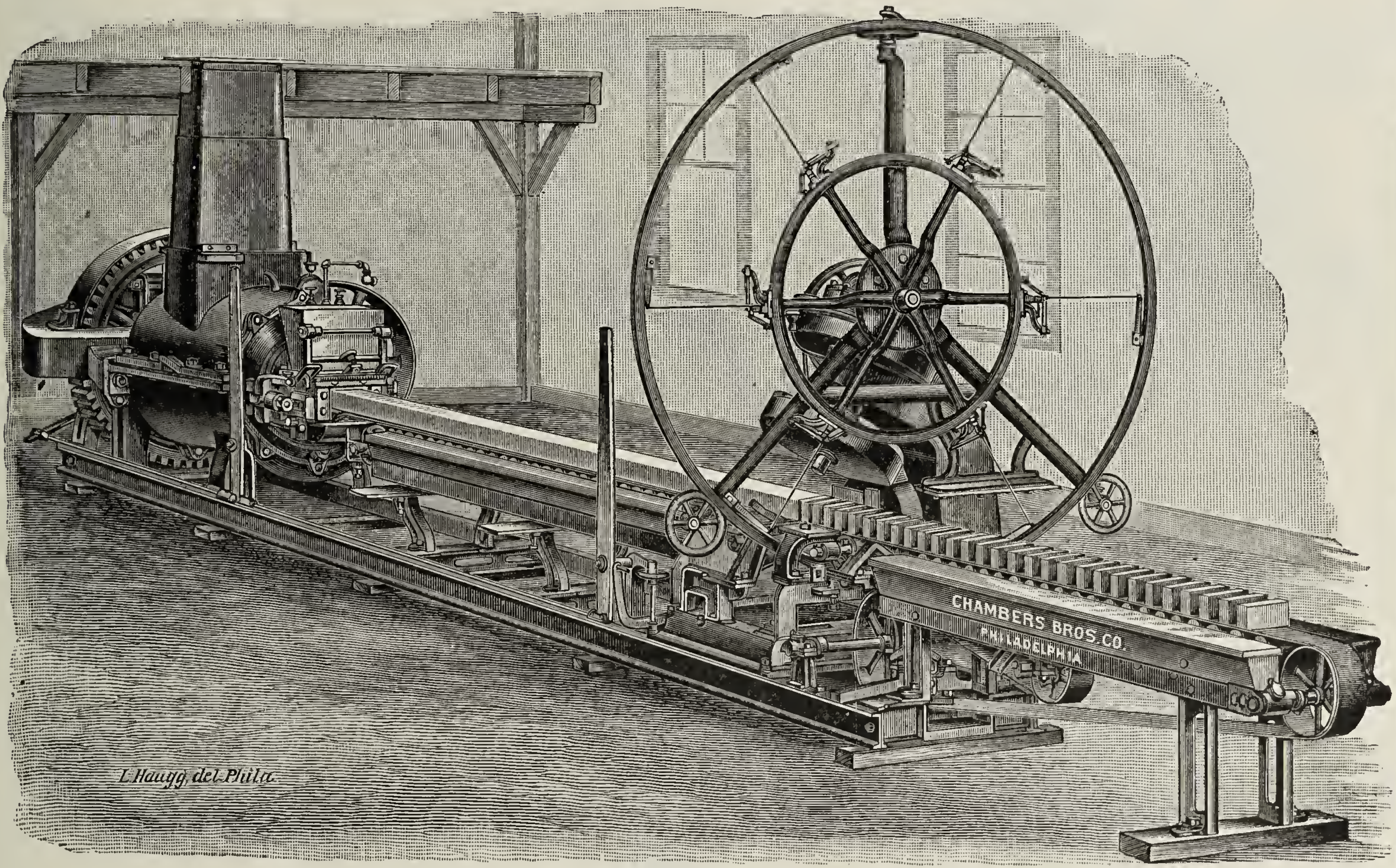
FOR PRICES AND FURTHER PARTICULARS ADDRESS THE

RELIANCE MACHINE AND TOOL WORKS
ST. LOUIS, MO.

MACHINERY FOR BUILDING BRICK

AND FOR STREET PAVERS

ROUND CORNER PAVING BRICK WITHOUT REPRESSING


CHAMBERS BROS. CO.
PHILADELPHIA
L. Haugg, del. Phila.

THE CHAMBERS AUTOMATIC SIDE-CUT BRICK MACHINE.

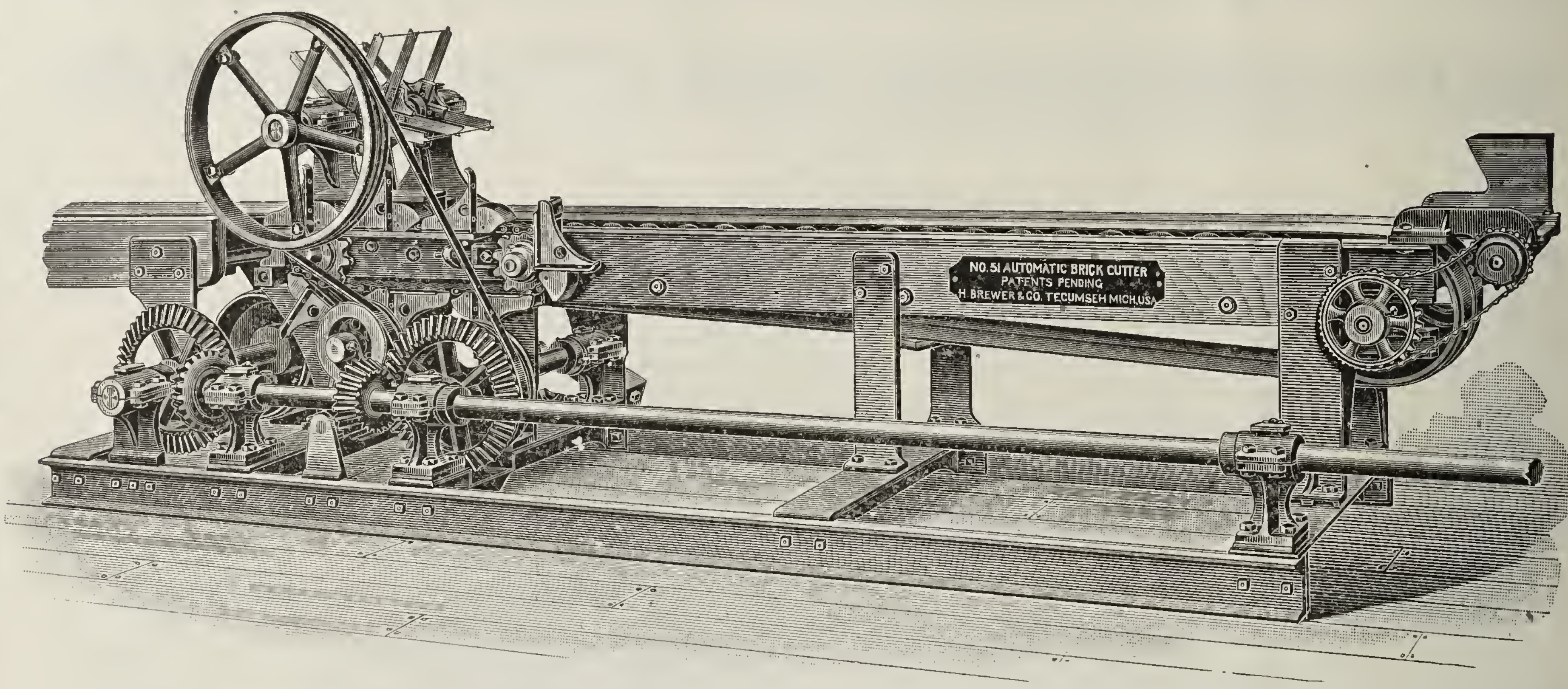
Automatic End Cut Brick Machines of five sizes, having capacity from 10,000 to over 100,000 brick daily under favorable conditions.

CHAMBERS BROTHERS COMPANY

52D AND MEDIA STREETS
PHILADELPHIA, PA.

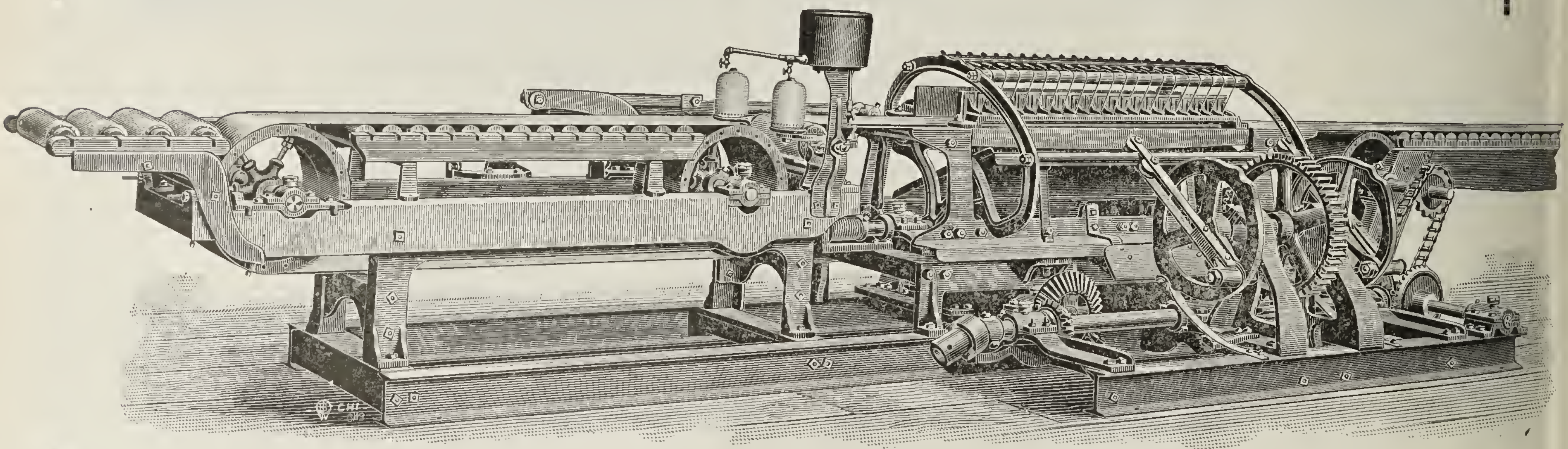
E. R. FRAZIER, Chicago Agent,
59 West Jackson Boulevard.

Automatic Brick Cutters


NO. 51 AUTOMATIC BRICK CUTTER
PATENTS PENDING
H. BREWER & CO. TECUMSEH MICH. U.S.A.

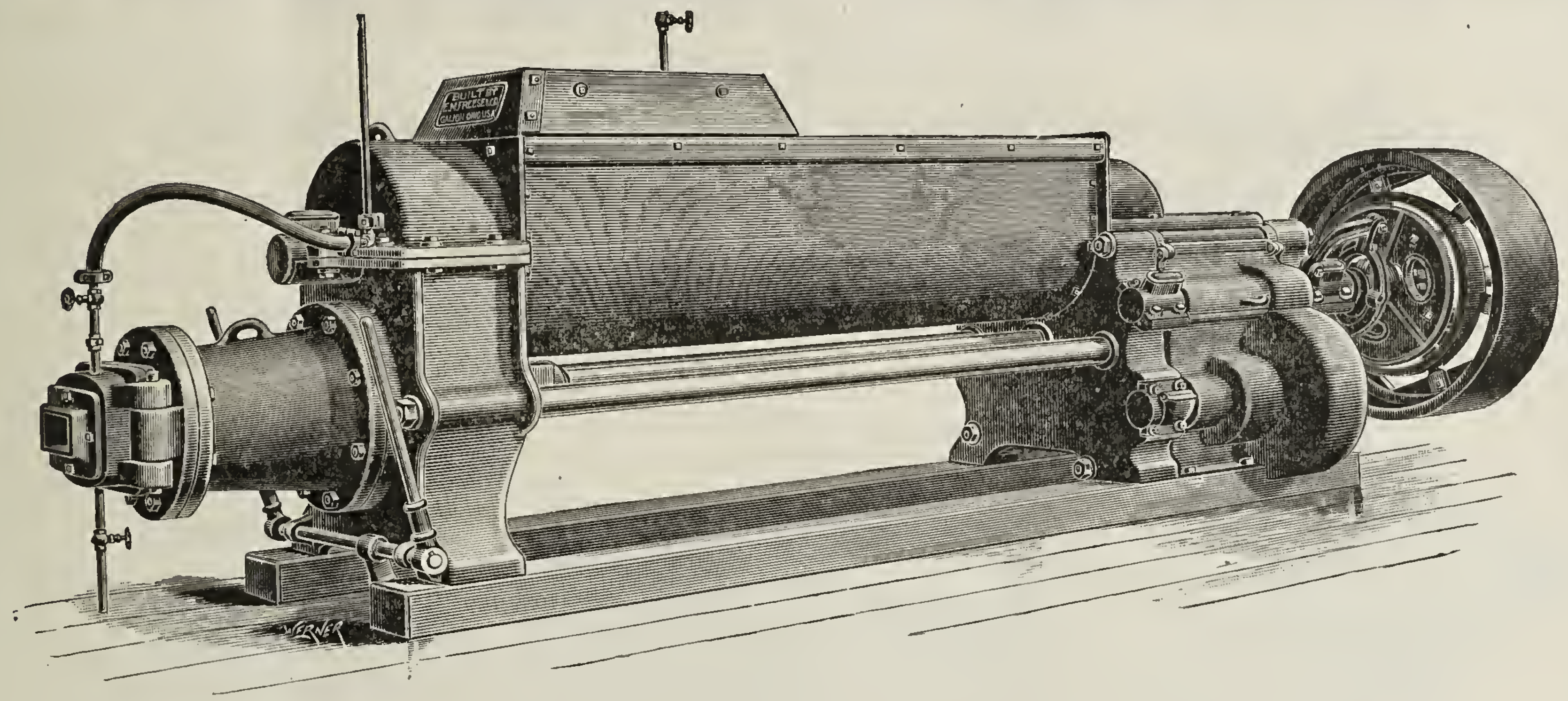
We are producing a line of automatic cutting machinery which is not only extensive but simple and efficient. There are many good things about simple automatic machines. They cost less. They wear longer. They are easier to understand and they work better.

Let us know your requirements and we will quote you some prices.



H. BREWER & CO., TECUMSEH, MICHIGAN.

UNION BRICK MACHINES



We build these Machines in five sizes. Capacities to 10,000 brick per hour.

Several hundred are in everyday use. They do first-class work and are convenient, economical and durable. This can be verified by investigation.

We also build Brick Machines with separate Pug Mill.

Don't forget our Automatic Cutters. **They give satisfaction.**

State your requirements and let us furnish particulars.

E. M. FREESE & CO.

GALION - - - - OHIO

LAMINATION is the source of more loss, more worry and more anxiety than all other troubles of a brickmaker

---

KENTON C READ, Pres. ANDY O'CONNELL, Vice Pres. and Gen'l Mgr C. M. MILLER, Sec.-Treas.

THE

C. M. Miller Mfg. and Mining Co. Inc.

MAKERS OF

High Grade Veneer and Building Brick

Office, 331 Ohio Street.

New Phone 1142.

Terre Haute, Ind. Dec. 22. *1904.*

Mr. H. L. Hix, Mgr.
The Wallace Mfg. Co., Frankfort, Ind.:

Dear Sir—I feel that I must tell you my experience with the brick made on the Intermediate Wonder:—

A few days ago a very prominent contractor asked me to bring him some samples of our brick. I fixed up some samples and started to his place, and just as soon as he saw them, he said: "I don't want them—they are no good; I would not lay one of that kind of brick," but I begged him to look at them and tell me why he did not want them. He asked me if he could break one of them, and I said, "Yes, break all of them." So he took his hammer and hit one on the corner; then he looked up at me and said: "I never saw a stiff mud brick like that;" then he broke it all up, just as nice as any brick, and he said: "That is the first stiff mud brick I ever saw without lamination," and that they were all right.

We are now selling our brick as fast as we can deliver them.

Pardon me for taking your time, and with SUCCESS to the WONDER, I am,

Yours very truly,

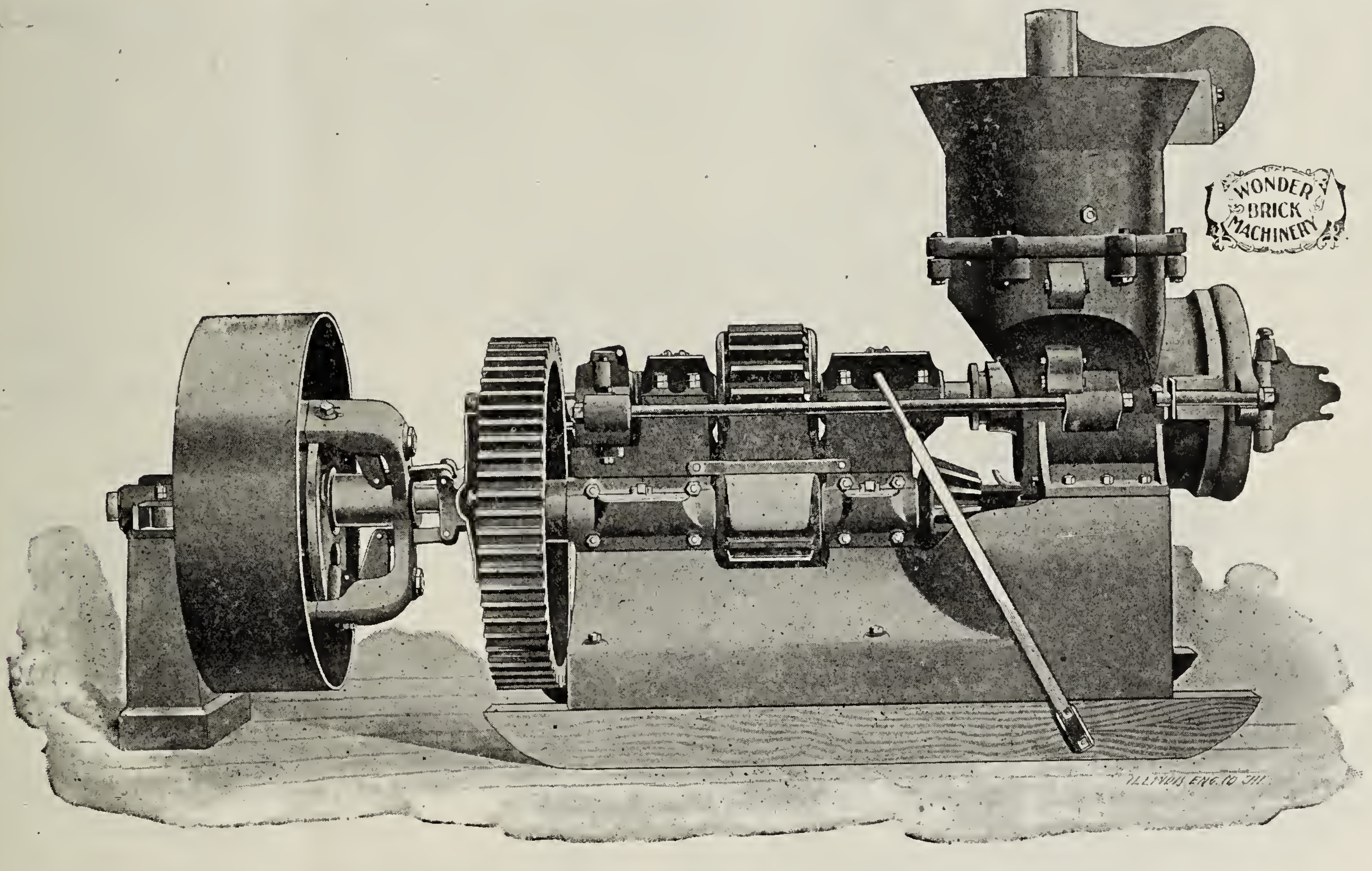
Andy O'Connell
V P and Gen Mgr.

In the event that you want to make brick filled with LAMINATION, CRACKS and CROOKS, a Wonder Machine will not answer your purpose.

THE WALLACE MFG. CO.

FRANKFORT, IND., U. S. A.

PRAISED BY
EVERY USER



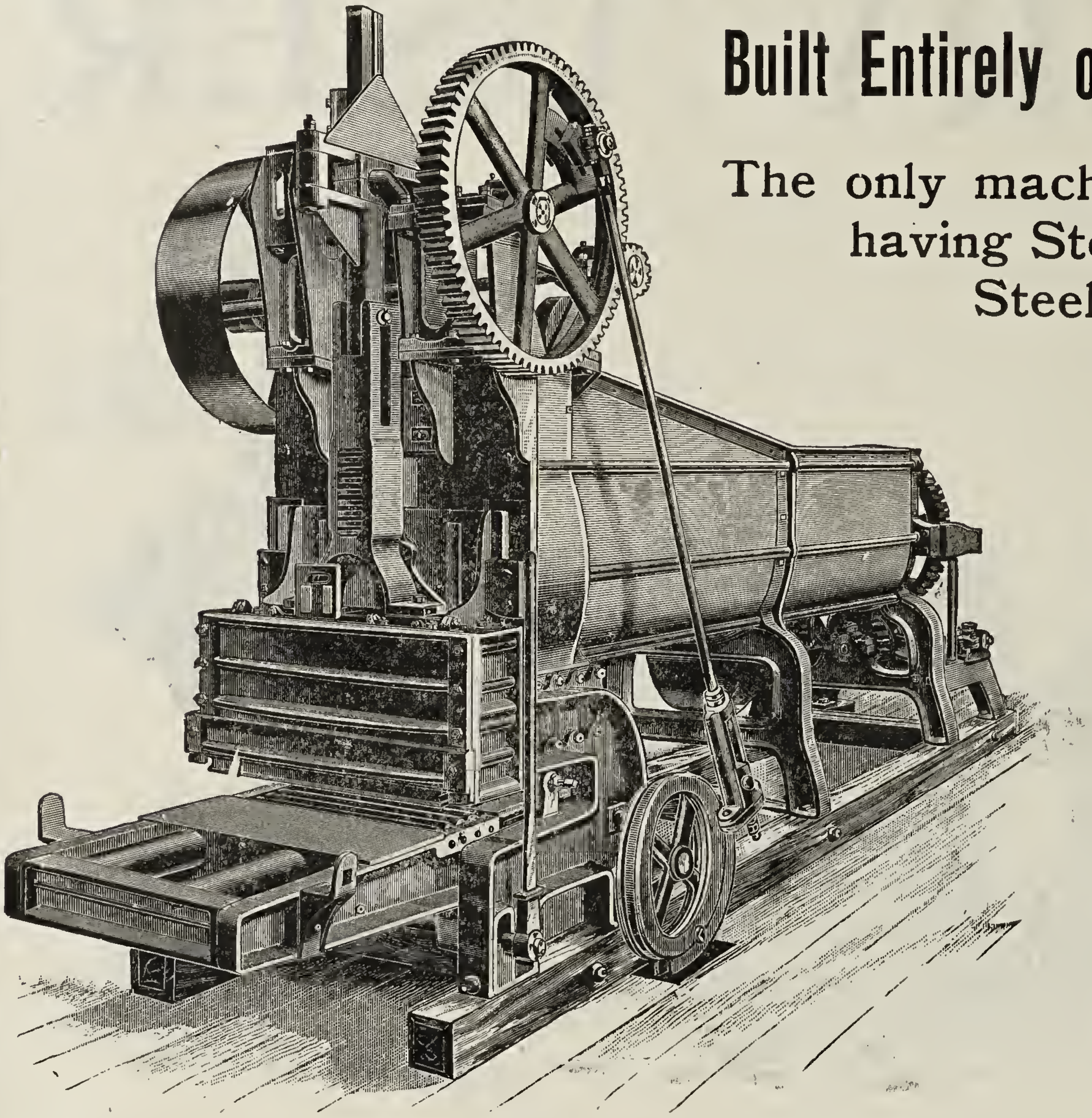
INTERMEDIATE WONDER.

40,000 daily capacity. Meets the requirements of the brickmakers.

The Wallace Mfg. Co.

FRANKFORT, IND., U. S. A.

THE POTTS
HORIZONTAL BRICK MACHINE



Built Entirely of Iron and Steel.

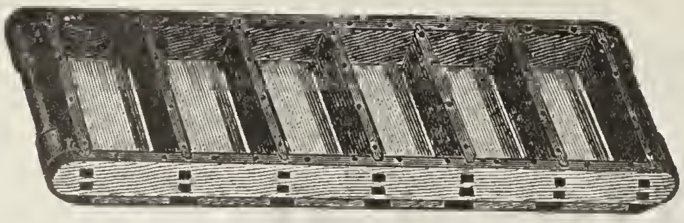
The only machine of this class having Steel Gear and Steel Shaft.

Built of the Best Material by the Best Workmen.

Simple, Strong and Durable.

No extra pug mill required to enable working the clay direct from the bank. Its great strength enables working the clay as stiff as practicable, insuring brick which will be STRAIGHT and SQUARE.

THE LEADER OF ALL SAND MOULD MACHINES.



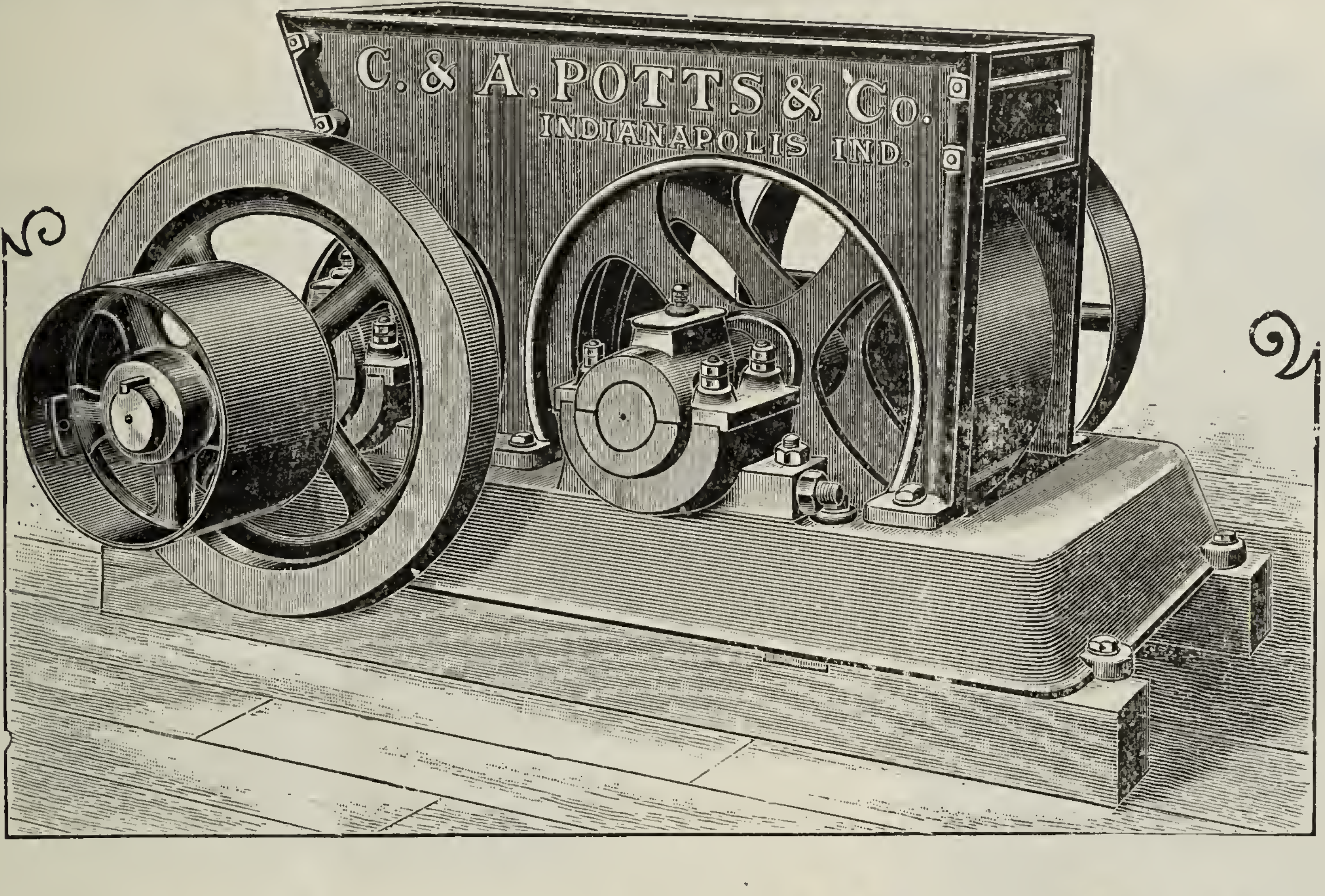
BRICK MOULDS A SPECIALTY

QUALITY IS OUR AIM.

We manufacture a complete line of Brick Yard Supplies. Write for prices.

C. & A. POTTS & CO., Indianapolis, Ind.

THE POTTS DISINTEGRATOR


C. & A. POTTS & Co.
INDIANAPOLIS IND.

Is not a spite machine, but is built the best possible. Having Heavy Chilled Rolls, Ring Oiling Bearings, Shafts of Steel and large in Diameter. The most successful machine for grinding out sticky clays and separating the stone.

THE POTTS MOULD SANDER

Simple in Construction,

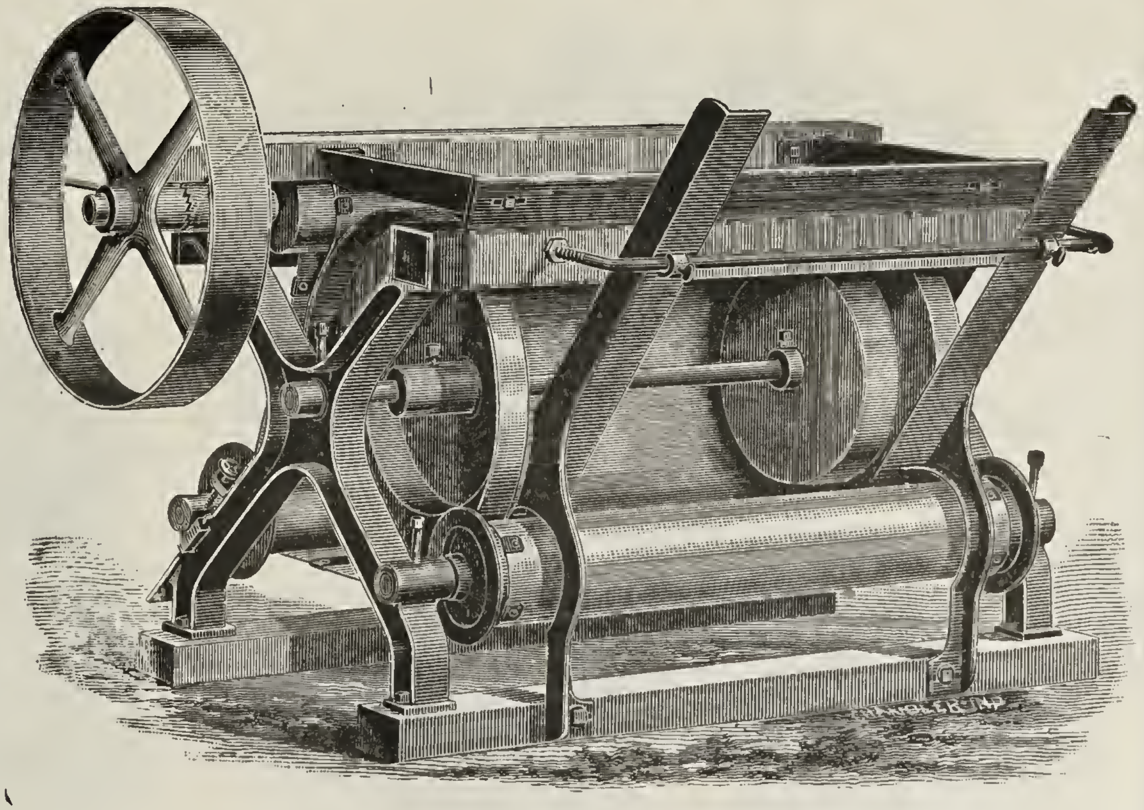
Strong and Durable,

Sands the Moulds Perfectly,

Never Strikes or gets Drunk,

Always Ready for Work,

No Brick Machine Complete without this Machine.



Patented February 5, 1889.

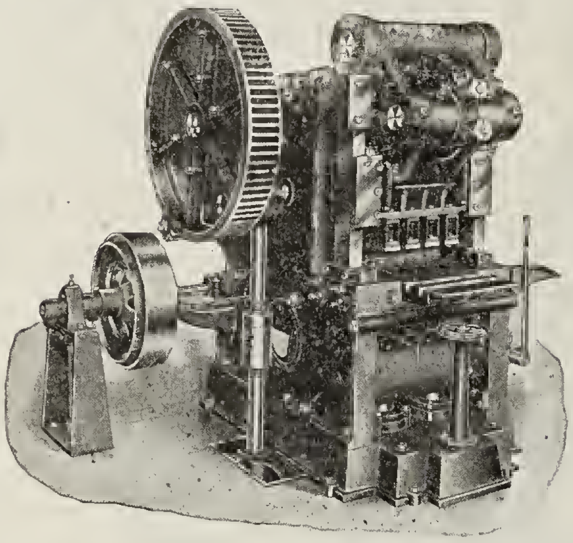
We make a specialty of equipping Sand Mould plants complete. We are the largest manufacturers of this class of machinery in the world. Write for prices.

C. & A. POTTS & CO., Indianaoplis, Ind.

Built Right Run Right

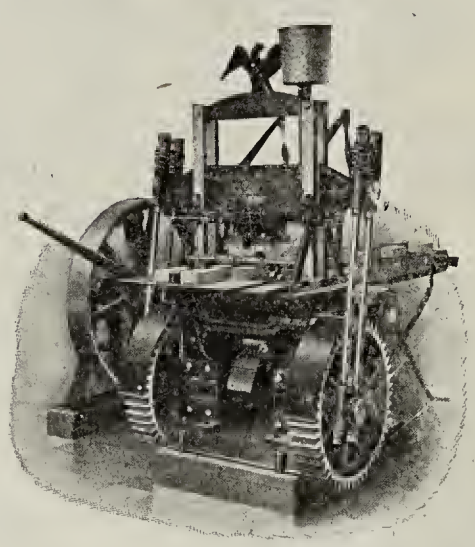
The American Clay Machinery

These are a few of the many Superior machines we manufacture for the Clay Trade. Large cuts



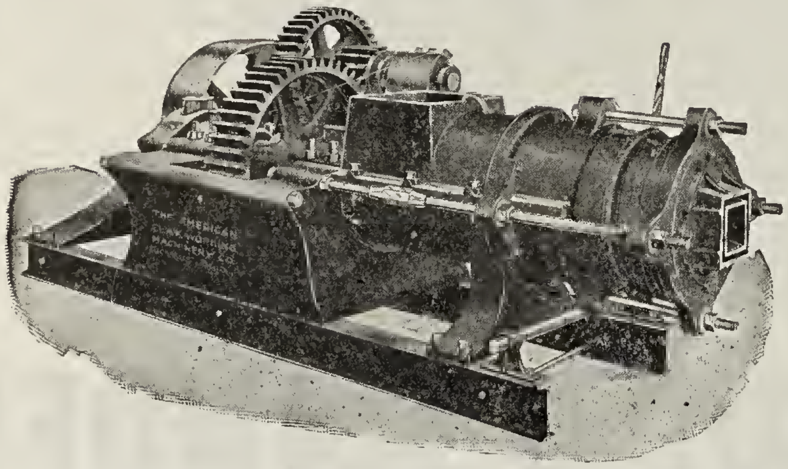
DRY PRESS BRICK MACHINERY.

We build a full line of Dry Press brick machinery. We have four styles and eight sizes, ranging in capacity from 1,000 to 3,000 brick per hour. This cut is our four mold, Moldel B press, especially adapted to Sand-Lime brick. Write for complete catalogue.

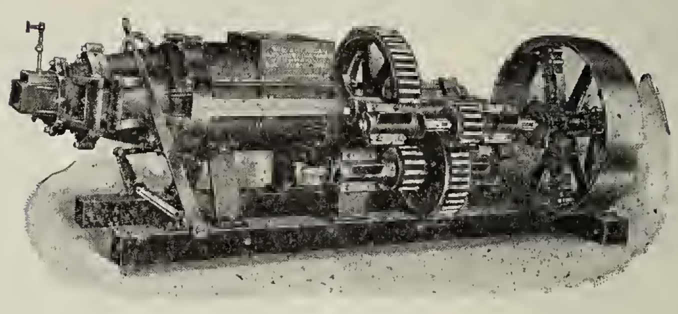


REPRESSES.

We build a large and complete line of represses in six sizes and styles. Capacity runs from 600 to 2,500 brick per hour. Send for our complete catalogue. This cut is of our double mold Eagle Repress.

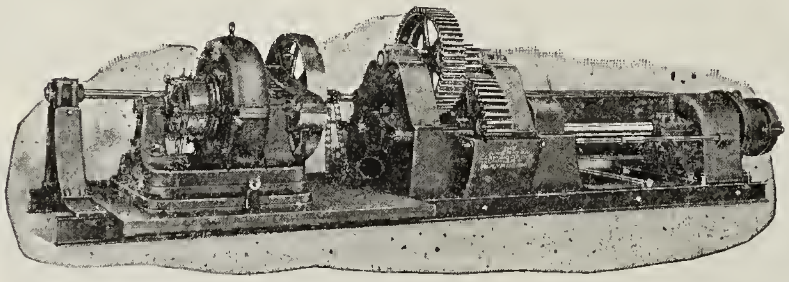


No. 40 AUGUR MACHINE FOR HOLLOW WARE.



No. 2 GIANT AUGER BRICK MACHINE.

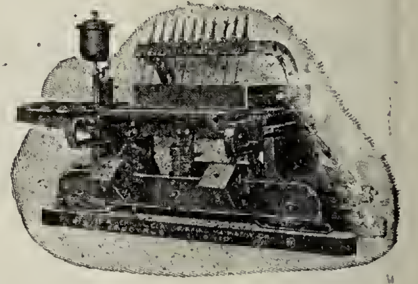
We build ten sizes and styles of Auger Machines. Capacities 1,500 to 10,000 brick per hour. Write for complete list.

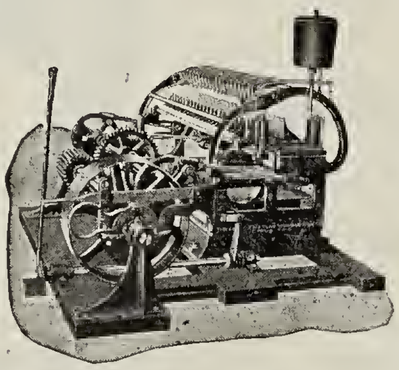


No. 23 ELECTRICAL DRIVEN, LOW FRAME, COMBINED MACHINE.

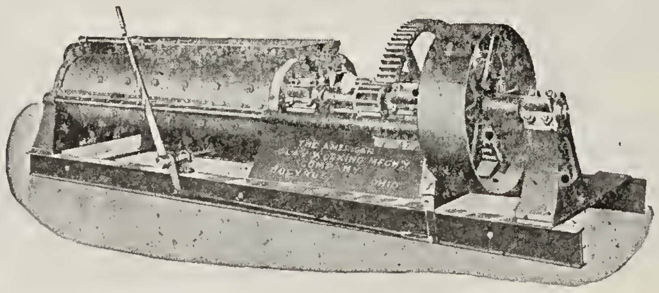
We make a full line of electrical driven clay-working machinery. Send for catalogue.

SEMI-AUTOMATIC AND HAND POWER CUTTERS





We make twenty-five styles of semi-automatic and hand power cutters for brick, tile and hollow ware. Write for full list and description.

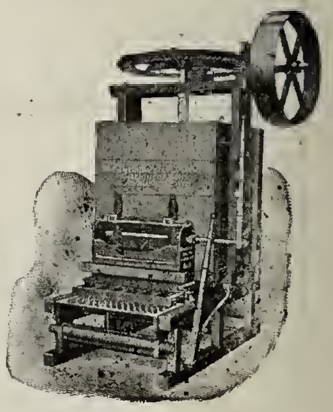


No. 38 DOUBLE SHAFT PUG MILL.

We build twenty different styles and sizes of pug mills to suit the needs of varying clays. Send for complete list and description.

SOFT MUD BRICK MACHINES.

Our Eagle Steam and Horse Power Brick Machines are the best built for small capacity. They are complete with molds, etc. Write for our soft mud booklet. These machines are especially adapted for export.



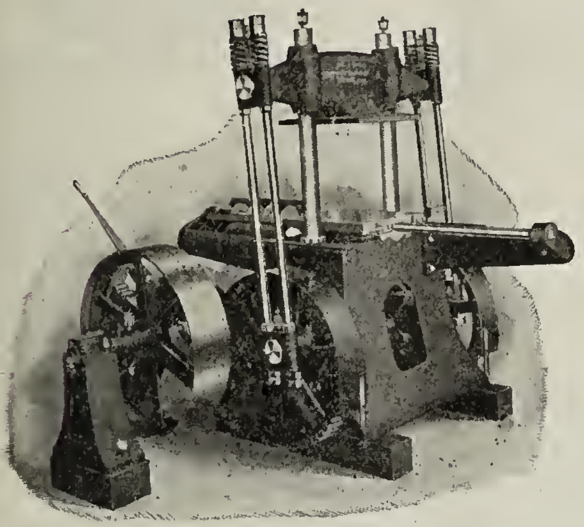
Built Right Run Right

Dry Press, Stiff Mud and Soft Mud Brick Machinery. Sand-Lime Brick Machinery, Cement, and Pottery Machinery. Waste Heat and Steam Dryers
Everything needed by the Clay Workers.

Company, Bucyrus, Ohio, U. S. A.

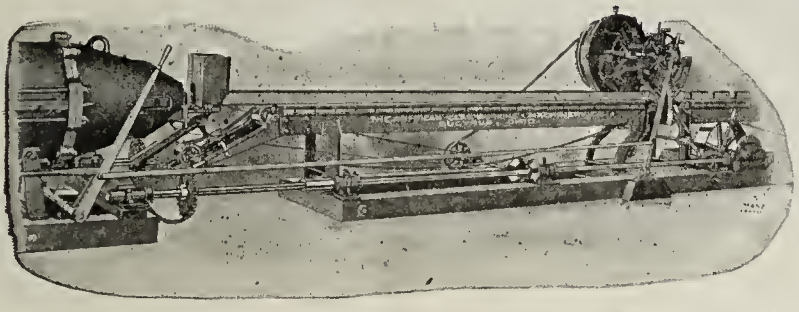
Built Right Run Right

and full descriptions of these and a hundred other machines we make will be sent upon request.



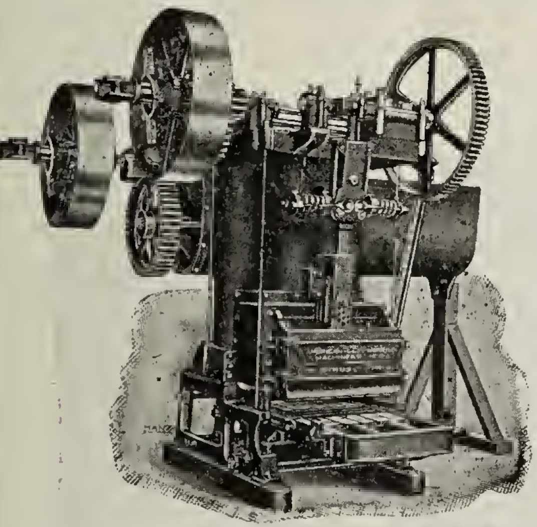
ROOFING TILE PRESS.

We build four styles of Roofing Tile Presses for the pressing of Hip Rolls, Crestings, etc. Write for complete description.



AUTOMATIC, END CUT, BRICK CUTTER, STYLE "P."

For end cut brick this machine is excellent. We build several styles of automatic cutting tables. Write for particulars.

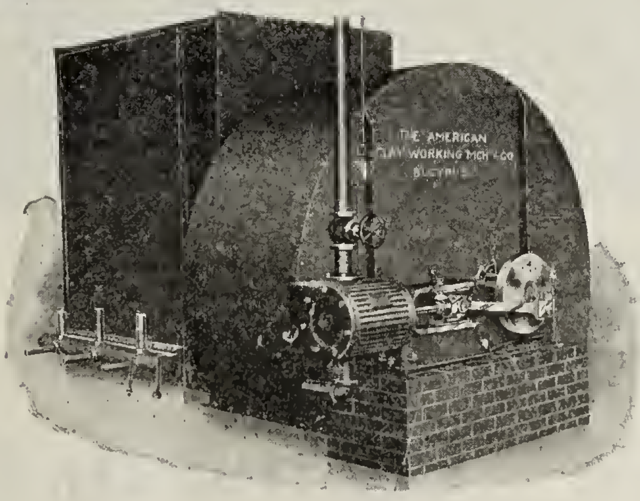


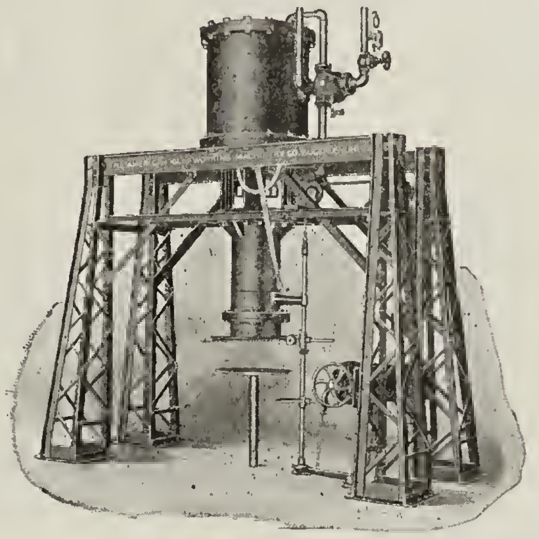
SAND MOLD BRICK MACHINE.

This machine is especially adapted for sand mold brick. It is an excellent machine. Write for a complete description.

WASTE HEAT AND STEAM DRYERS.

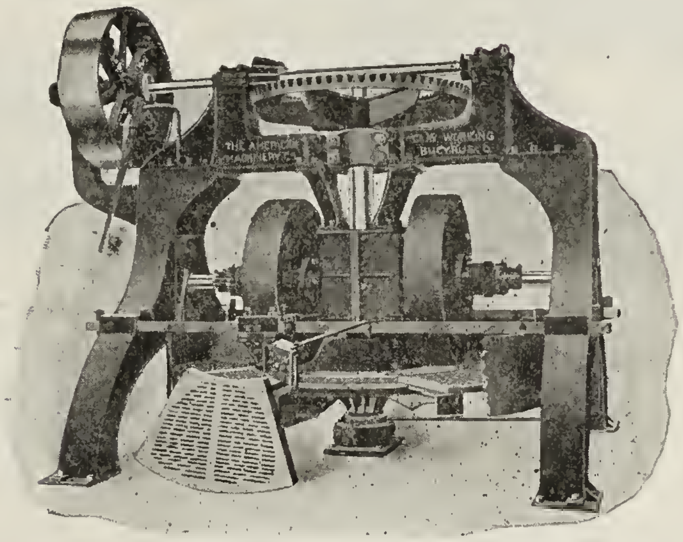
We build both waste heat and steam dryers and can dry the most tender clay. Plans and estimates furnished upon application. We can dry your product at one-half the present cost or less. The cut is of our waste heat dryer outfit.





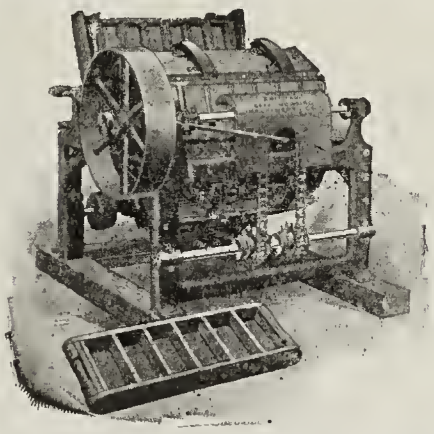
SEWER PIPE MACHINERY.

We build three styles of Sewer Pipe Presses, together with all appliances for a complete plant. Send for our big catalogue.


THE AMERICAN CLAY WORKING MACHINERY CO BUCYRUS O.

DRY AND WET PANS.

We build twenty styles of Dry and Wet Pans in varying capacity. They are all constructed of iron and steel and are most substantial. A complete description of the full line will be sent for the asking.

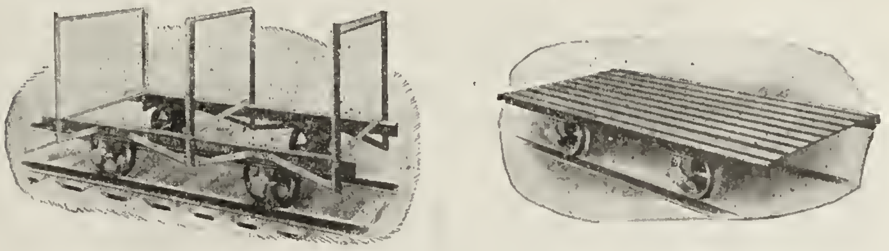


CHAMPION MOLD SANDER.

This is an excellent machine and sand molds evenly and economically. It is entirely automatic. Send for description.

OUR LINE OF CARS.

We build dry cars and clay dump cars in forty varieties. Send for car catalogue as it is sure to contain just what you want.



THE AMERICAN CLAY MACHINERY COMPANY

BUCYRUS, OHIO, U. S. A.

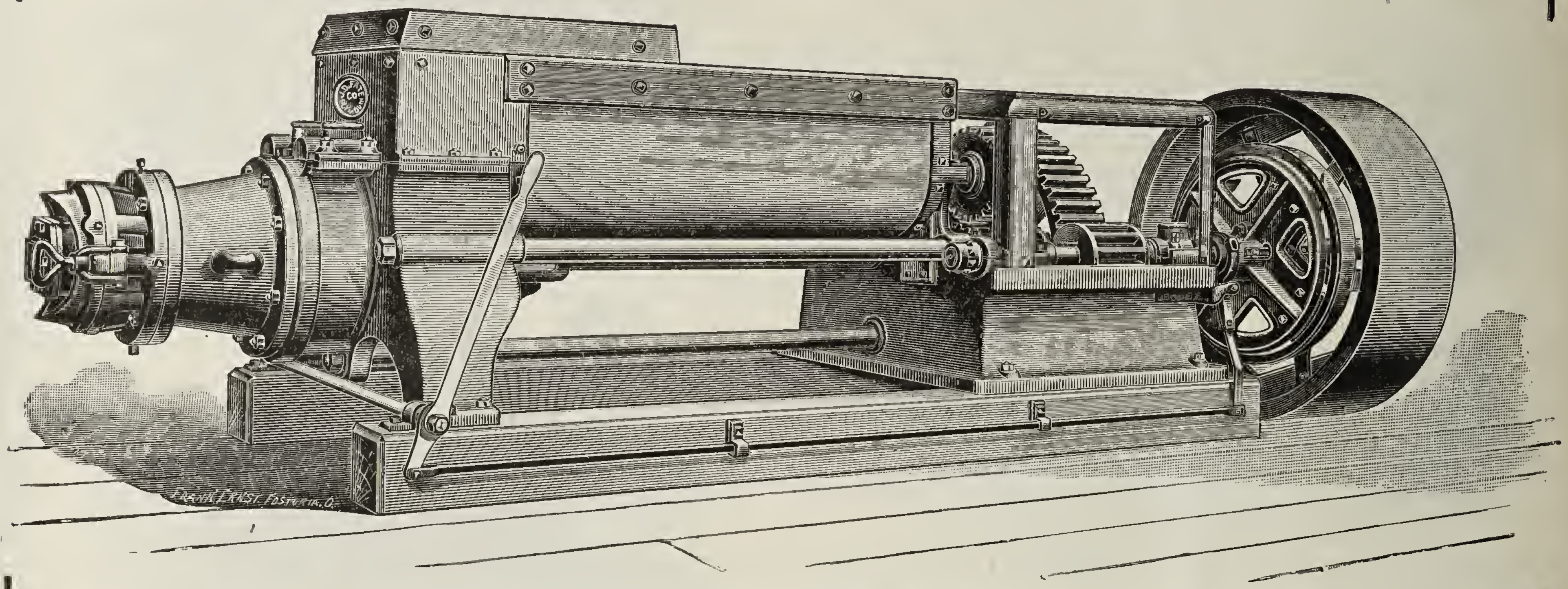
Built Right Run Right

THE PREMIER LINE
THE J. D. FATE COMPANY

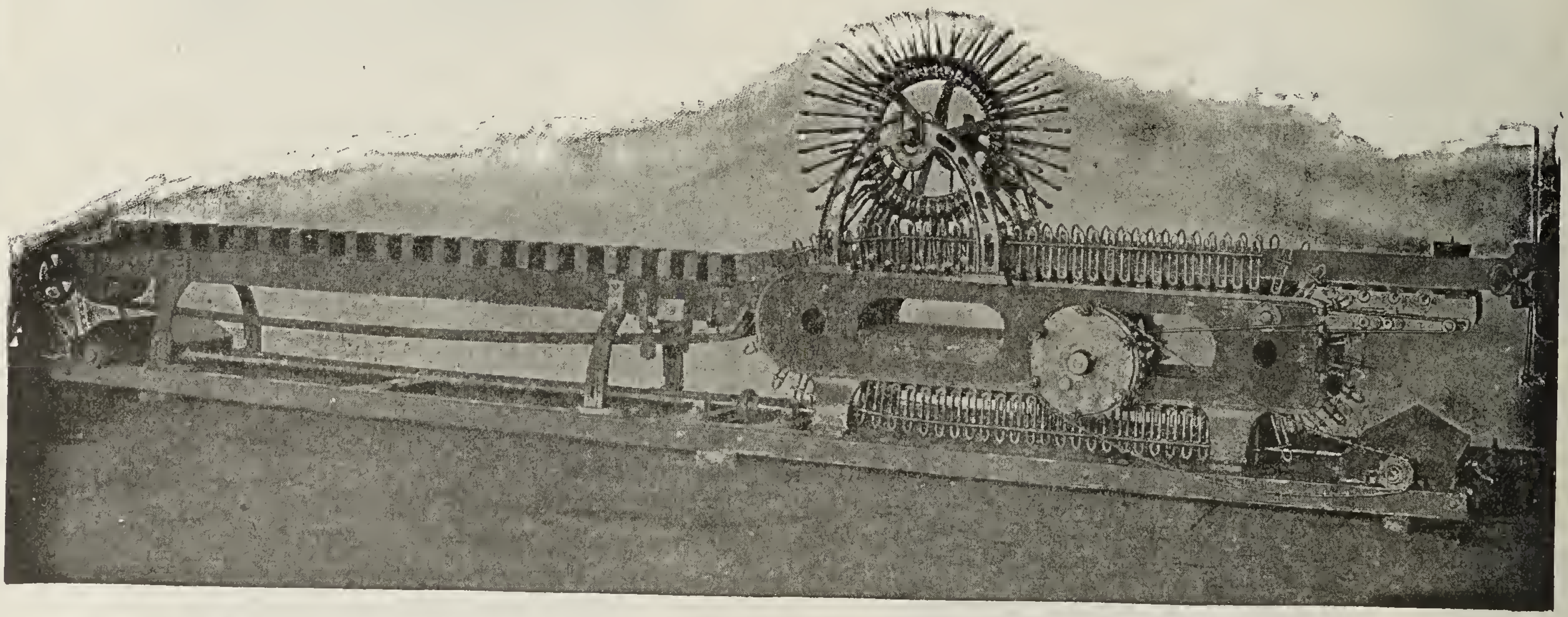
THE "PREMIER"

Combined Brick Machine

THE LARGEST LINE OF AUTOMATIC CUTTING TABLES IN THE WORLD


FRANK ERNST. FOSTORIA, O.

WITH BENSING'S AUTOMATIC SIDE-CUT BRICK TABLE.



Make a combination of Brick Machinery which is pronounced by practical brick makers to be the most perfect arrangement of stiff mud machinery now on the market.

It is unequaled for strength, durability, capacity and quality of ware produced.

Write us for catalog and full particulars of the "Premier" line of Clay Working Machinery.

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CLAY RECORD

Vol. XXVI. No. 8. CHICAGO, APRIL 29, 1905. Semi-Monthly, $1.00 per Year
Single Copies, - 10 Cents

RESULTS OF TESTS OF COMMON BUILDING BRICK FOR THE BUREAU OF BUILDINGS, NEW YORK CITY.

BY IRA H. WOOLSON.*

In connection with investigative work for the Bureau of Buildings, Borough of Manhattan, upon many new composition building materials now appearing on the market in the form of bricks, building blocks, etc., it became desirable to know the strength and other properties of the common clay brick at present used in this city. Diligent search failed to discover any test records which were at all adequate to our needs. In fact, the paucity of information was surprising. A few test records were found in various engineering books, but the data were very incomplete and many of the tests were so ancient that the results were practically valueless. Methods of brick manufacture have changed greatly in the past twenty-five years, and naturally the quality of the products has also changed. The set of tests recorded here was undertaken for the purpose of supplying the much-needed information.

The experiments include tests of transverse and crushing strength, also absorption, fire and freezing tests. It is believed that the series is more complete than any that has hitherto been published upon the brick of this vicinity; however, it is recognized that the data are too meager to enable one to draw definite conclusions. They simply give an indication of probable values. At least five times this number of tests should be made upon each kind of brick before final judgment is passed upon its quality.

The samples for test were selected at the building where they were to be used, and much care was exercised to secure average quality stock. Although all the varieties of brick used in the city were not tested, it is believed that those selected fairly represent the machine-molded, soft mud brick now being delivered in the city. Through the courtesy of the Bureau of Buildings the standard specifications adopted by the Bureau are printed in connection with this article. The specifications are based upon the data of these tests, supplemented by such other information as was obtainable.

As a rule, strength tests were made on five bricks of each variety. If the bricks were unevenly burned, showing some "hard" and some "salmon" or "pale" burned bricks among an otherwise average medium burned stock, the selection of five bricks would be made to include one each of the hard and soft-burned classes. If the bricks were badly burned with the result that a large percentage showed fire cracks, or if carelessness in screening the clay was evidenced by occasional large pebbles in the bricks, one of these more or less defective bricks was included in the test lot. In selecting the brick no attention was paid as to where or by whom they were made. Subsequent investigation disclosed that they were all manufactured along the shore of the Hudson river. One set of Philadelphia pressed brick was tested for comparison. The trade-marks which the bricks bore have been omitted from the report for obvious reasons.

The following method of testing was adopted: Five bricks were first tested transversely, producing ten half bricks. Five of these were tested for crushing strength; three others were taken to determine absorption, being afterwards crushed wet. The remaining two half bricks were used for fire tests. Duplicate bricks were used for the balance of the fire test, and for the freezing tests. By this plan the same bricks were used for the different tests so far as possible. A detailed description of the method of conducting each test is given, because such information is often useful to investigators who desire to compare results. Unfortunately, many published test reports lost much value because these data are omitted.

Table I gives a detailed statement of the results of each test.

TRANSVERE TEST.—The bricks were supported on well-rounded knife-edge supports 7 ins. apart, care being taken to insure an even bearing on each support, thus avoiding twisting stresses. The load was applied at the middle by a similar rounded edge.

The modulus of rupture was calculated from the well-known formula $R = \frac{3}{2} \frac{W l}{b h^2}$, and serves to bring the transverse strength to a common standard for comparison, irrespective of variations in size of cross-section.

The results in many cases were much lower than expected, and indicate either that brick have deteriorated in quality or that the figures given in engineering hand-books and text-books are based upon tests of selected stock, in which case they are misleading. With two or three exceptions, the average modulus of rupture was 20 to 50 per cent lower than recorded for common brick in most books. As brick in a wall rarely fail by crushing, but often break crosswise, due to unequal loading, or settlement of foundation, the transverse strength is an important characteristic. The average modulus of rupture for the series exclusive of the Philadelphia brick was 499 lbs. per sq. in.

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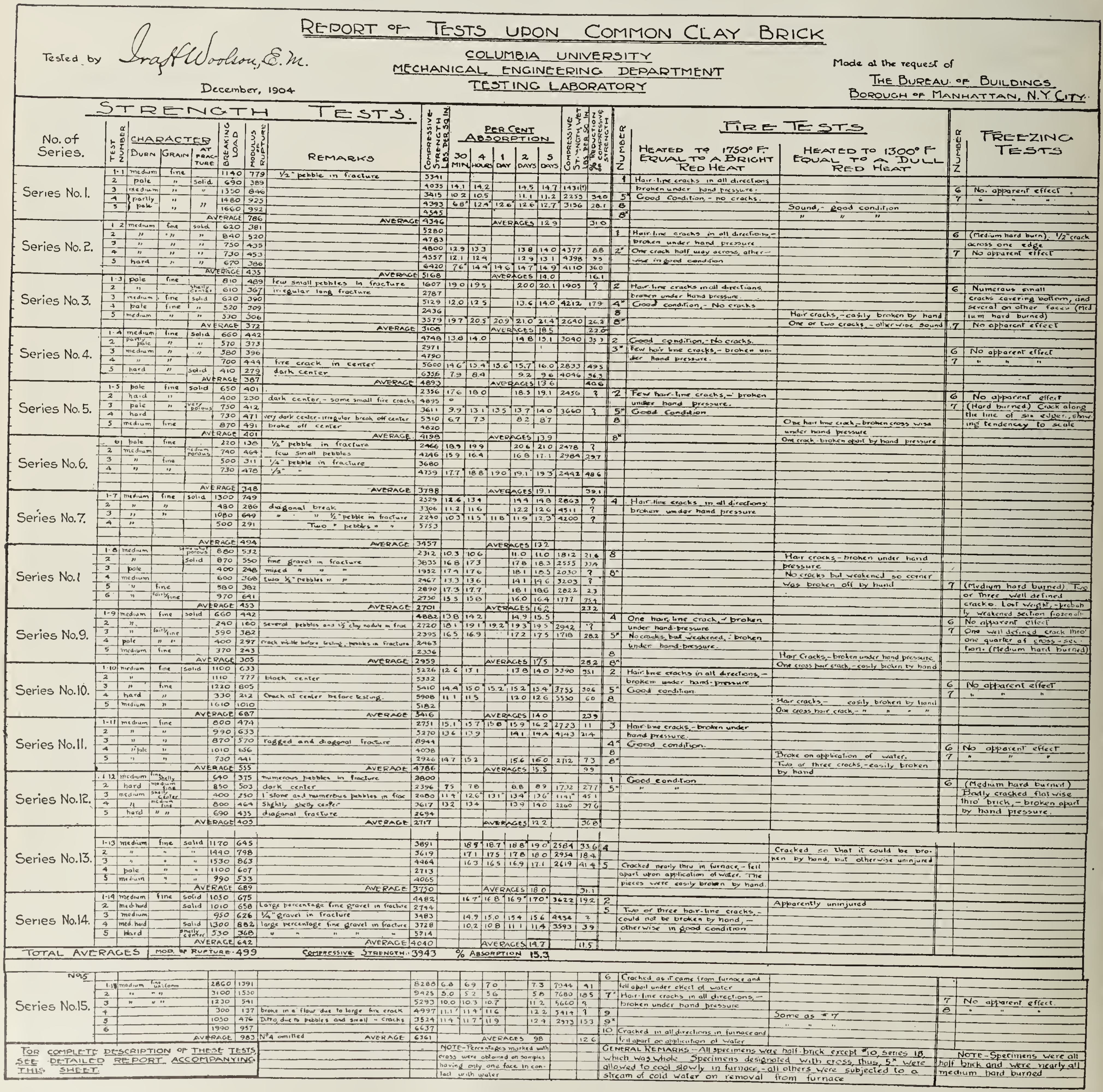
COMPRESSIVE TESTS.—The half bricks used for this test were faced with a thin layer of plaster to provide an even bedding surface and an adjustable bearing plate in the machine insured uniform loading over the whole surface.

Apparently no intimate relation exists between the transverse and crushing strengths. While in a general way the results of one test may indicate what to except in the other, it is an uncertain guide, for wide variations in one kind of test show no corresponding fluctuations in the other. This same fact was noted by the State Geologist of New Jersey in discussing a large series of tests made by the writer upon the bricks of that State, the report of which was recently published in Volume VI. of the State Geological Survey.

The lack of conformity between the transverse and crushing strength is plainly shown in Table 2, where the top of each heavy parallel line indicates the average compressive strength of five brick of one variety, while the bottom end of the line indicates the average transverse strength of the same five bricks. The apparent absence of relation between the strength and the absorption is also indicated by the irregular curve below the parallel lines, in which the average point of absorption for each variety of brick

TABLE I



REPORT OF TESTS UPON COMMON CLAY BRICK

Tested by Ira H. Woolson, E. M.
December, 1904

COLUMBIA UNIVERSITY
MECHANICAL ENGINEERING DEPARTMENT
TESTING LABORATORY

Made at the request of
THE BUREAU OF BUILDINGS
BOROUGH OF MANHATTAN, N.Y. CITY.

STRENGTH TESTS.

No. of Series.	Test Number	Character			Breaking Load	Modulus of Rupture	Remarks	Compressive Strength Lbs. per Sq. In.	Per Cent Absorption					Compressive Strength Wet Lbs. per Sq. In.	Reduction % Compressive Strength	Number	Fire Tests		Number	Freezing Tests
		Burn	Grain	At Fracture					30 Min	4 Hours	1 Day	2 Days	5 Days				Heated to 1750° F. Equal to a Bright Red Heat	Heated to 1300° F Equal to a Dull Red Heat		
Series No. 1.	1·1	medium	fine		1140	779	½" pebble in fracture	5341								1	Hair-line cracks in all directions broken under hand pressure.			
	2	pale	"	Solid	690	389		4035	14.1	14.2		14.5	14.7	1431(?)						
	3	medium	"	"	1350	846		3415	10.2	10.5		11.1	11.2	2255	34.0	5×	Good Condition, – no cracks.		6	No apparent effect
	4	partly	"	"	1480	925		4393	6.8×	12.4×	12.6×	12.6×	12.7×	3156	28.1	8		Sound, – good condition	7	" " "
	5	pale	"		1660	992		4545								8×		" " "		
					AVERAGE	786	AVERAGE	4346			AVERAGES		12.9		31.0					
Series No. 2.	1·2	medium	fine	solid	620	381		5280								1	Hair-line cracks in all directions, – broken under hand pressure		6	(Medium hard burn). ½" crack across one edge
	2	"	"	"	840	520		4783												
	3	"	"	"	750	435		4800	12.9	13.3		13.8	14.0	4377	8.8	2×	One crack half way across, other-wise in good condition		7	No apparent effect
	4	"	"	"	730	453		4557	12.1	12.4		12.9	13.1	4398	3.5					
	5	hard	"	"	670	386		6420	7.6×	14.4×	14.6	14.7×	14.9×	4110	36.0					
					AVERAGE	435	AVERAGE	5168			AVERAGES		14.0		16.1					
Series No. 3.	1·3	pale	fine		810	489	few small pebbles in fracture	1607	19.0	19.5		20.0	20.1	1905	?	2	Hair-line cracks in all directions, broken under hand pressure.		6	Numerous small cracks covering bottom, and several on other faces (Medium hard burned)
	2	"		shelly center	610	367	irregular long fracture	2787												
	3	medium	fine	solid	620	390		5129	12.0	12.5		13.6	14.0	4212	17.9	4×	Good condition, – No cracks			
	4	pale	fine	"	520	309		2436								8		Hair cracks, – easily broken by hand		
	5	medium	"	"	530	306		3579	19.7	20.5×	20.9×	21.0×	21.4×	2640	26.2	8×		One or two cracks, – otherwise sound		
					AVERAGE	372	AVERAGE	3108			AVERAGES		18.5		22.0				7	No apparent effect
Series No. 4.	1·4	medium	fine	Solid	660	442		4748	13.8	14.0		14.8	15.1	3040	35.3	2	Good condition, – No cracks.			
	2	partly pale	"	"	570	373		2971								3×	Few hair line cracks, – broken under hand pressure.			
	3	medium	"	"	580	396		4790											6	No apparent effect
	4	"	"		700	444	fire crack in center	5600	14.6×	15.4×	15.6×	15.7×	16.0	2833	49.5				7	" " "
	5	hard	"	solid	410	279	dark center	6356	7.9	8.4		9.2	9.6	4046	36.3					
					AVERAGE	387	AVERAGE	4893			AVERAGES		13.6		40.6					
Series No. 5.	1·5	pale	fine	solid	650	401		2356	17.6	18.0		18.5	19.1	2456	?	2	Few hair-line cracks, – broken under hand pressure.		6	No apparent effect
	2	hard	"		400	230	dark center, – some small fire cracks	4895	°										7	(Hard burned) Crack along the line of six edges, showing tendency to scale
	3	pale	"	very porous	750	412		3611	9.9×	13.1×	13.5	13.7	14.0×	3660	?	5×	Good Condition			
	4	hard			730	471	very dark center – irregular break off center	5310	6.7	7.3		8.2	8.7			8		One hair line crack – broken cross wise under hand pressure		
	5	medium	fine		870	491	broke off center	4820												
					AVERAGE	401	AVERAGE	4198			AVERAGES		13.9			8×		One crack - broken apart by hand pressure		
Series No. 6.	6	pale	fine		220	138	½" pebble in fracture	2466	18.9	19.9		20.6	21.0	2478	?					
	2	medium		medium porous	740	464	few small pebbles	4246	15.9	16.4		16.8	17.1	2984	29.7					
	3	"	fine		500	311	¼" pebble in fracture	3680												
	4	"	"		730	478	½" "	4759	17.7×	18.8×	19.0	19.1×	19.3×	2442	48.6					
					AVERAGE	348	AVERAGE	3788			AVERAGES		19.1		39.1					
Series No. 7.	1·7	medium	fine	solid	1300	749		2529	12.6	13.4		14.4	14.8	2863	?	4	Hair-line cracks in all directions broken under hand pressure			
	2	"	"		480	286	diagonal break	3306	11.2	11.6		12.2	12.6	4511	?					
	3	"	"		1080	649	" " ½" pebble in fracture	2240	10.3×	11.5×	11.8×	11.9×	12.3×	4200	?					
	4	"			500	291	Two " pebbles " "	5753												
					AVERAGE	494	AVERAGE	3457			AVERAGES		13.2							
Series No.8	1·8	medium		somewhat porous	880	532		2312	10.3	10.6		11.0	11.0	1812	21.6	8		Hair cracks – broken under hand pressure		
	2	"		Solid	870	550	fine gravel in fracture	3835	16.8	17.3		17.8	18.3	2555	33.4					
	3	pale			400	248	mixed " " "	1952	17.4	17.6		18.1	18.5	2030	?	8×		No cracks but weakened so corner was broken off by hand		
	4	medium			600	368	two ½" pebbles " "	2467	13.3	13.6		14.1	14.6	3203	?					
	5	"	fine		580	382		2890	17.3	17.7		18.1	18.6	2822	2.3				7	(Medium hard burned). Two or Three well defined cracks. Lost weight, – probably weakened section frozen off.
	6	"	fairly fine		970	641		2730	15.5	15.8		16.0	16.4	1777	35.4					
					AVERAGE	453	AVERAGE	2701			AVERAGES		16.2		23.2					
Series No. 9.	1·9	medium	fine	solid	660	442		4882	13.8	14.2		14.9	15.5			4	One hair line crack, – broken under hand-pressure			
	2	"			240	160	several pebbles and 1½" clay nodule in frac	2720	18.1	19.1×	19.2×	19.3×	19.5	2942	?				6	No apparent effect
	3	"	fairly fine		590	382		2395	16.5	16.9		17.2	17.5	1718	28.2	5×	No cracks, but weakened, – broken under hand-pressure.		7	One well defined crack thro' one quarter of cross-section. (Medium hard burned)
	4	pale	" "		400	297	crack visible before testing, – pebbles in fracture	2463												
	5	medium	fine		370	243		2336								8		Hair Cracks, – broken under hand pressure		
					AVERAGE	305	AVERAGE	2959			AVERAGES		17.5		28.2	8×		One cross hair crack, – easily broken by hand		
Series No. 10.	1·10	medium	fine	solid	1100	633		5226	12.6	13.1		13.8	14.0	3390	35.1	2	Hair-line cracks in all directions, – broken under hand-pressure			
	2	"			1110	777	black center	5332												
	3	"	fine		1220	805		5410	14.4×	15.0	15.2×	15.2	15.4×	3755	30.6	5×	Good condition.		6	No apparent effect
	4	hard	"		330	212	Crack at center before testing.	5908	11.1	11.5		12.0	12.6	5550	6.0	8		Hair cracks, – easily broken by hand	7	" " "
	5	medium	"		1610	1010		5182										One cross hair crack, – " " " "		
					AVERAGE	687	AVERAGE	5416			AVERAGES		14.0		23.9					
Series No. 11.	1·11	medium	fine		800	474		2751	15.1×	15.7×	15.8×	15.9	16.2	2723	1.1	3	Hair-line cracks, – broken under hand pressure.			
	2	"	"		990	633		5270	13.6	13.9		14.1	14.4	4143	21.4					
	3	"	"		870	570	ragged and diagonal fracture	8944								4×	Good condition.			
	4	" pale	"		1010	656		4038								8		Broke on application of water.	6	No apparent effect
	5	"	"		730	441		2926	14.7	15.2		15.6	16.0	2712	7.3	8×		Two or three cracks, – easily broken by hand	7	" " "
					AVERAGE	555	AVERAGE	4786			AVERAGES		15.5		9.9					
Series No. 12.	1·12	medium	fine shelly		640	375	numerous pebbles in fracture	2800								1	Good condition			
	2	hard	medium fine		850	503	dark center	2396	7.5	7.8		8.8	8.9	1732	27.7	5×	" "		6	(Medium hard burned) Badly cracked flat wise thro' brick, – broken apart by hand pressure.
	3	medium	shelly center		400	250	1" stone and numerous pebbles in frac	2080	11.4×	12.6×	13.1×	13.4×	13.6×	1141×	45.1					
	4	"	medium fine		800	464	Slightly shelly center	3617	13.2	13.4		13.9	14.0	2260	37.6					
	5	hard	" "		690	435	diagonal fracture	2694												
					AVERAGE	405	AVERAGE	2717			AVERAGES		12.2		36.8					
Series No. 13.	1·13	medium	fine	solid	1170	645		3891		18.9×	18.7×	18.8×	19.0×	2584	33.6	4		Cracked so that it could be broken by hand, but otherwise uninjured		
	2	"	"	"	1440	798		3619		17.1	17.5	17.8	18.0	2954	18.4					
	3	"	"	"	1530	863		4464		16.3	16.5	16.9	17.1	2619	41.4	5	Cracked nearly thru in furnace, – fell apart upon application of water. The pieces were easily broken by hand.			
	4	pale	"	"	1100	607		2713												
	5	medium	"	"	990	533		4065												
					AVERAGE	689	AVERAGE	3750			AVERAGES		18.0		31.1					
Series No. 14.	1·14	medium	fine	solid	1050	675		4482		16.7×	16.8×	16.9×	17.0×	3622	19.2	2		Apparently uninjured		
	2	med. hard		solid	1010	658	Large percentage fine gravel in fracture	2794								5	Two or three hair-line cracks, – could not be broken by hand, – otherwise in good condition			
	3	medium			950	626	¼" gravel in fracture	3483		14.9	15.0	15.4	15.6	4954	?					
	4	med. hard		Solid	1300	882	large percentage fine gravel in fracture	3728		10.2	10.8	11.1	11.4	3593	3.9					
	5	Hard		shelly center	530	368	" " " " "	5714												
					AVERAGE	642	AVERAGE	4040			AVERAGES		14.7		11.5					
TOTAL AVERAGES					MOD. OF RUPTURE	499	COMPRESSIVE STRENGTH	3943	% ABSORPTION				15.3							
Nº5																6	Cracked as it came from furnace and fell apart under effect of water			
Series No. 15.	1·15	medium	fine uniform		2860	1391		8288	6.8	6.9	7.0		7.3	7944	9.1					
	2	"	" "		3100	1550		9425	5.0	5.2	5.6		5.8	7680	18.5	7×	Hair-line cracks in all directions, – broken under hand pressure			
	3	"	" "		1230	541		5293	10.0	10.3	10.7		11.2	5660	?				7	No apparent effect.
	4				300	137	broke in a flaw due to large fire crack	4997	11.1×	11.4×	11.6		12.2	5414	?	9		Same as #7	8	" " "
	5				1050	476	Ditto, due to pebbles and small " cracks	3524	11.4×	11.7×	11.9		12.4	2973	15.3	9×		" " "		
	6				1990	957		6637								10	Cracked in all directions in furnace and fell apart on application of water			
					AVERAGE	983	Nº4 omitted AVERAGE	6361			AVERAGES		9.8		12.6					

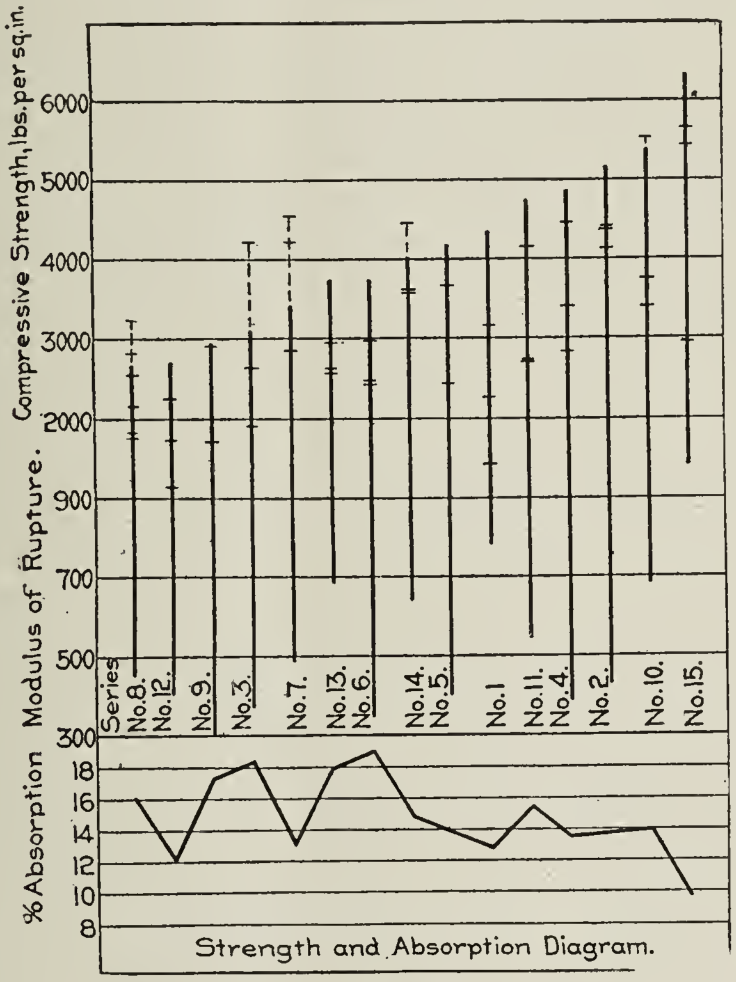
FOR COMPLETE DESCRIPTION OF THESE TESTS, SEE DETAILED REPORT ACCOMPANYING THIS SHEET.

NOTE – Percentages marked with cross were obtained on samples having only one face in contact with water

GENERAL REMARKS – All specimens were half-brick except #10, Series 15, which was whole. Specimens designated with cross, thus, 5× were allowed to cool slowly in furnace, – all others were subjected to a stream of cold water on removal from furnace

NOTE – Specimens were all half brick and were nearly all medium hard burned is plotted immediately under the parallel line representing the strength of the same brick. In studying the comparison, however, it must be remembered that the strength averages were plotted from sets of five, while the absorption tests were made in sets of three. This might make some difference. A much larger number of tests should be made in order to obtain a true index of the relation if any exists.

The effect of crushing the bricks while wet is also shown on the parallel lines by the short cross lines, each cross line indicating one brick. In cases where the strength wet was an increase rather than a decrease, it is shown by a dotted line at the end. The average compressive strength of the present series exclusive of the Philadelphia pressed brick was 3,943 lbs. per sq. in.



Strength and Absorption Diagram.

ABSORPTION TEST.—Following the line of some experiments made by the writer during the past year upon rapidity of absorption in bricks, the method of getting that value in this instance was as follows:

Three samples of each variety of brick were chosen. The samples were all half bricks, thus giving one broken surface. They were first carefully dried at a temperature of about 150° F. to a constant weight. This usually took four or five days. Two of the bricks were then immersed in water and the third was placed with one face only in contact with the water to a depth of ⅛ in.

Weighings were made and absorption calculated by weight at 30 minutes, 4 hours, 1 day, 2 days and 5 days. The results are very interesting. As a rule over 90% of the total absorption took place during the first 30 minutes. In four hours the absorption was nearly complete. The average increase from two days to five days was less than ½ of 1%, thus showing the latter limit to be unncessary for comparative work. It is surprising to note that in the majority of cases the bricks which had one face only in contact with the water had a higher percentage of absorption in 30 minutes than those of the same variety which were fully immersed. This advantage once gained was maintained throughout.

From the experience of a large number of comparative tests, it is the writer's opinion that this is the correct way to make absorption tests. The water is drawn up into the specimen by capillary attraction and drives the air out, thus giving a more perfect saturation than is obtained by placing the specimen under water. It also approaches more nearly the condition of a brick in the face of a wall exposed to a rainstorm. Some investigators are arguing that the only proper way to make an absorption test upon this material is first to exhaust the air by vacuum pump. It would undoubtedly give a higher percentage, but would it be a fair result? The writer objects to that method as introducing unnatural and forced conditions which could never actually exist in practice. It is extremely doubtful if air which is so thoroughly occluded in a brick that it requires a vacuum pump to remove it would ever come out when that brick is built into a wall.

It is important that a brick be first dried to a *constant weight,* then if placed with one face in contact with water for 48 hours it is pretty certain to absorb about as much water as would ever get into it under natural conditions. Long-continued contact with water will increase the absorption a little, but not enough to make it worth while to continue the test over 48 hours. The rate of absorption is important, and is obtained by weighing at short intervals in the beginning of the test. No study was made of the effect of varying the depth the single face was immersed, but it probably would make little difference up to one-third the height of the brick.

Whether this method would prove equally satisfactory when applied to a dense brick like a paving brick was not determined. It is quite likely they would require deeper immersion.

There is another very decided advantage gained by wetting one side only. If a brick has any tendency to stain or effloresce this method will bring it out. If a stain is likely to occur it will probably appear before complete absorption has taken place. The water will drive it out at the top. Efflorescence may also appear in the same way while the brick is wet, but ordinarily not. However, if there is any tendency to produce this discoloration, it will promptly appear when the brick begins to dry after the absorption test is finished. It will be noted that the New York Building Bureau has adopted this method of test in its standard specifications.

Immediately after the specimens had been weighed for the five days of absorption, they were faced with plaster and crushed to ascertain the effect of saturation upon the strength; comparison being made with the other half of the same brick tested in its normal condition. Over 70% of the brick showed a decrease in strength varying from 10 to 45%. The remainder reversed the proposition and gave an increase rather than a decrease in strength.

The reason for this is uncertain, but probably may be attributed to the well-known fact that owing to presence of pebbles, small cavities or imperfect burning, one-half of a common clay brick is often much stronger than the other half. This is the only explanation which would account for the erratic results obtained. One column of the table is devoted to the percentage loss, due to crushing wet, but when there was a gain it is indicated by an interrogation mark (?), no calculation being made.

FIRE TESTS.—The fire test was applied merely to ascertain the relative resistance of each variety of brick to heat. The method used was adopted simply because it was a convenient way to get relative results. Whether it is the best method for a laboratory test is undetermined, but it served the purpose intended. Possibly it is too severe. Without doubt the correct way to test brick by fire is to build a wall in a test house and then test it like a partition.

Two half brick of each variety were placed in a cold gas oven and so arranged that the flames could play about them, but the sharp jets of blue flame could not strike them. The heat was raised very gradually, a temperature of 800° F. being obtained in half an hour, and 1,700° F. (about the heat of a burning building) in 50 minutes. This heat was then maintained for 10 minutes. A maximum of 1,750° F. was recorded. At the expiration of one hour one brick of each kind was removed and immediately placed under a strong jet of cold water. The duplicates were allowed to cool slowly in the furnace. As a rule, the bricks subjected to water showed the worse punishment, but there were exceptions. Nearly all of them were perceptibly. A second test was made in the same manner, except that the maximum temperature attained was 1,300° F. The effects were the same in kind, but little less in degree, as may be seen by inspection of the table. It is evident that bricks of this character cannot be heated to dull redness without danger of being ruined. A peculiar fact only explainable by variation in quality of samples is that the specimens heated to a bright red heat were generally in better condition than those heated to a dull redness.

Tests on two or three lots were missing in the fire and freezing series, because enough bricks were not secured at first, and later they could not be found. Many piles were covered deep with ice and snow.

FREEZING TESTS.—Two half bricks from each lot were taken for this test. They were first soaked for a week, then placed in a refrigeration room and allowed to freeze, after which they were thoroughly thawed in water at about 120° F. The thawing occupied about 40 minutes. They were then put back in the freezing room. This alternate freezing and thawing was repeated 20 times. The period of freezing usually occupied 23 hours, but occasionally 47 hours were taken. The temperature ranged from 4° to 16° F.

The results of the test were not very satisfactory. Only one brick was really ruined by the test, and it had an open, shelly structure. A few of the others developed cracks, but the larger part showed no apparent deterioration.

Sand-lime and cement materials tested in the same way have given data equally favorable to the brick. Some experiments are being made to ascertain if a greater number of freezings will break down the specimens.

The writer's results on this test are not in accord with those printed by Prof. Marston in *Engineering News* for April 21, 1904, and further supplemented by recent letters. Prof. Marston is usually able to disintegrate any brick in 6 to 15 freezings at temperatures slightly above zero. His work is all done on 1-in. cubes cut from the bricks, and this may account in part for the variation in results. Perhaps there is also a difference in quality of material tested. The writer is strongly of the opinion that whole or half bricks should be tested, preferably the latter, because they expose the interior to action of water and frost.

If 1-in. cubes are cut from a brick, it is likely to cut the bonds of the material and the small portion tested will not offer the resistance of its original condition. This is particularly true in clay bricks where a distinct lamination is often shown in a fractured surface. Of course it is much cheaper and easier to test a dozen 1-in. cubes than a dozen half bricks if the freezing is done by salt and ice mixture. On the other hand, this would be largely offset by the cost of cutting. The writer has made a few tests upon one and two-inch cubes, but the results are not different from those obtained upon the largest samples.

The Atlas Portland Cement Co. have invited the members of the Engineers Club of St. Louis to visit their works near Hannibal, Mo., Saturday, April 15th. A special Pullman train has been provided. A big spread will be served.

DRAIN TILE, ITS USE AND METHOD OF MANUFACTURE.*

By Charles Burridge, of Tecumseh, Mich.

The use of drain tile seems to be quite generally misunderstood outside the territory where drainage is almost an absolute necessity to secure any crops at all; and even there we find a great many who have an entirely wrong idea of it. It seems to be a common impression that the great purpose of drain tile is to carry off standing water from some swamp or frog-pond, and that the landowner fortunate enough to have no such places on his premises has no use for tile. In the first place we should not speak of drainage, for that term has proved to be misleading. We should say under-drainage if we desire to make a plain statement. Even then we do not imply the full value of the use of drain tile, for they do more than drain; or perhaps we should say that in draining they effect other results not expressed by the name of the process.

Now let us consider step by step just what this under-drainage is, what it does, and for just what reasons it is employed. In the first place, it rains (we will leave snow and other forms of moisture out of consideration for the present), and this rain saturates the earth with which it comes in contact; that is, the particles of soil absorb all the water they can hold and the spaces between the particles become filled; then the rain runs off the surface, carrying with it the animal and vegetable fertilizer which has accumulated there, and deposits it on the lowlands or in some swamp or empties it into the river. Shortly the sun comes out and bakes a crust over the surface of the field, sealing up the interstices between the particles of soil and cutting off all air from the roots of the vegetation. Then the farmer "cultivates" to break up this crust in order that the roots of the growing crop may have the necessary air to insure proper growth. These are the conditions when there are no drain tile in the ground; but let us introduce the tile.

It rains—and this rain saturates the soil with which it comes in contact; not on the surface only, but clear down to the tile, and the surplus which the soil will not absorb is carried away through the tile. The soil is left open and porus; the air is free to circulate through it; the moisture line goes much lower than it otherwise would; and the decayed animal and vegetable matter upon the surface is carried into the soil, where it may promote the growth of the crop in the field instead of the skunk cabbage and cattails in the neighboring swamps. And this is not all. The moisture line having been extended downward, there is less water on the surface; being less water, there is less evaporation; and there being less evaporation, the temperature of the soil is higher, for evaporation causes cold. The temperature is also elevated by contact with the rain, which in coming down has absorbed the heat from the atmosphere through which it has passed. Good authority states that the temperature of the soil of a well-drained field is, practically speaking, as high as it would be were the field 200 miles further south, thus lengthening the farming season from two to three weeks—just enough to change the entire summer's operation from one continuous frantic endeavor to keep up with the procession, to that of being ahead on the band-wagon, with enough leisure to enjoy the music and to do everything well and in proper season.

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*Read at the Manitowoc meeting of the Wisconsin Clayworkers' Association.

So far we have spoken of under-drainage, principally, in regard to its functions during wet weather, but we must not forget the drought and how the drain tile rule works both ways. The soil is dry, but there is always some moisture in the air, and the air circulating through the soil and the tile, which is possible owing to the loose condition of the former due to the presence of the latter, leaves its moisture there. The dew gathers at night, and the soil, being open and porous, absorbs it readily and carries its moisture down to the roots of the growing plants.

But the proper and advantageous disposition of rain water and assistance at times when there is no rain are not all that drain tile are good for. There are other kinds of water to be disposed of; for instance, the cold spring water that comes up through the soil from below. This is water which has fallen upon the earth once before, filtered through the earth and given up all its fertilizing matter and all its heat. It chills the soil; it crusts over the surface; it closes up the air spaces around the particles, and is much more detrimental than heavy rain to an undrained field. Drain tile, properly placed, arrest the upward course of this water, and thereby not only keep the soil warm, but open and in condition to absorb the fertilizing rains. Still another use of drain tile is the proper care of the water which runs off the surface of the adjoining property which is not under-drained. This is good water, warm and full of fertilizer, but its course must be turned. It must go down and leave its fertilizer in the soil. Drain tile accomplishes that purpose, retaining all the good in the soil under which they lay and furnishing quick exit for all that is not beneficial.

The intimacy of relation between the user and manufacturer of drain tile varies according to locality; but whatever it may be, it is of vital importance that the manufacturer should understand the general principles of under-drainage and the proper installation of the tile. Cases have been cited where in the earlier days the manufacturer furnished the tile, installed them in the property of the land owner, and made agreement to settle after they had demonstrated to the satisfaction of the purchaser that they would effect the benefit claimed; but nowadays such radical selling methods are unnecessary although the tile maker, especially in a territory where under-drainage is not common, should know the purchaser or agent understands the proper use of his product.

It used to be thought that the drain tile factory had to be located right in the center of a territory which would consume its output, in order that the buyer might come to the plant with his wagon and haul away the tile he wanted to use at that particular time. This condition made the market the first consideration and the clay to be used a point to be decided later, with a result that the plants were generally small, the clay very frequently indifferent in character, and the cost of production comparatively high. But at the present time we can point to numerous establishments located without regard to local market, where the clay is suitable for economical working, where the transportation facilities to the points of consumption are good, and where fuel can be readily obtained at a fair price. There is of course a limit to the distance which can profitably exist between the manufacturer and consumer of drain tile, but this limit is much greater than is ordinarily supposed when the factory is large, the clay subject to easy access and ready manipulation, and proper fuel readily obtained. From this we gather the point that in the establishment of a drain-tile plant the clay, the transportation facilities and the necessary fuel supply must be of as desirable a nature and perhaps more plainly in sight than the market.

The methods employed in selecting and handlings clays for the manufacture of drain tile do not seem to differ materially from those followed in the production of other kinds of ware except it is usually considered necessary that a tile clay should be a little stronger than some of the so-called good brick clays; that it should be more free from roots, stones or other objectionable foreign substance; and that it should be much more thoroughly prepared before molding. While thorough preparation and pugging are a necessity in this branch of the clayworking business there is a money-losing process, still quite generally followed to gain those results, which should be discarded. This process is the tempering and mixing of the clay in a "soak pit." In the first place it costs something to excavate and plank up a good pit; in the second place, when it is done, it involves the extra labor of twice handling the clay; and in the third place it does not give any better results than proper disintegrating and pugging machinery. Soak pits have cost many a tile maker an amount which would be a fair profit in addition to the interest on the machinery investment necessary to take their places, and are an expensive relic of the old soft mud days when prices were higher and labor lower. It is possible, and most eminently practicable, to operate even a medium-size tile plant with only one handling of the clay from the time it is taken from the bank until it is molded and cut off; and even if the necessary machinery to effect these results cost twice as much as it does, it would still pay good dividends.

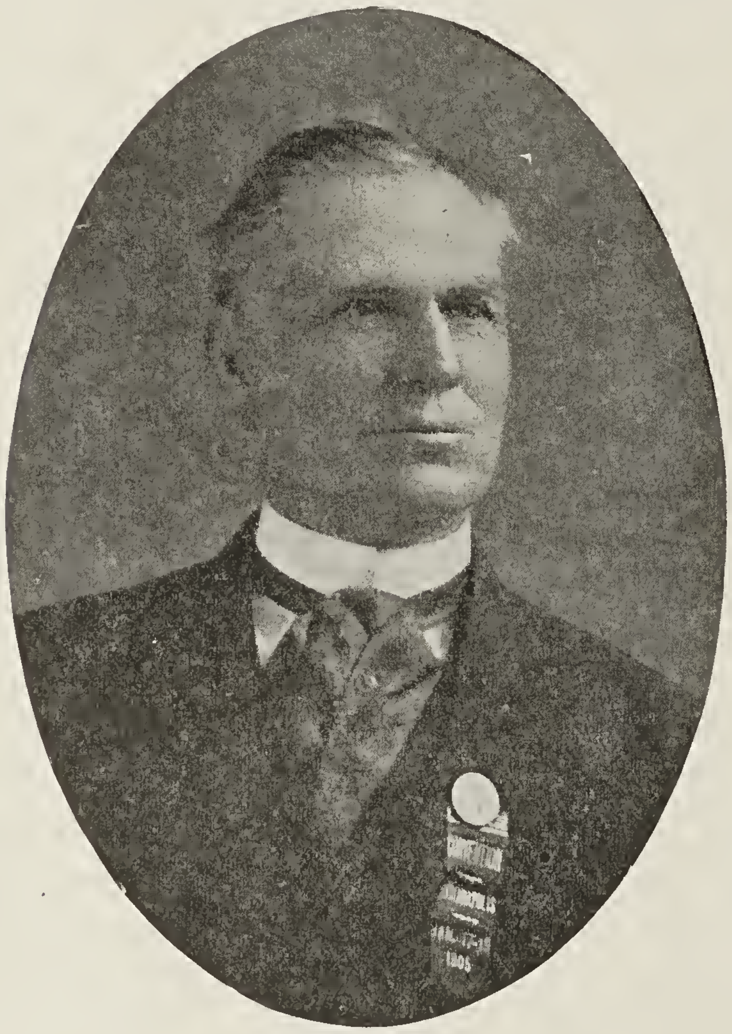
CEMENT CLAYS DISCOVERED IN MONTEREY COUNTY.

James Ladd of Portland, Ore., and A. Hart McKee of Pittsburg, are at the head of a syndicate which has just discovered an immense deposit of Portland cement clay near Chittenden, a small station on the Southern Pacific railroad sixty miles south of San Jose, Cal.

It is said to be the intention of the syndicate to bid on the cement contracts for the building of the Panama canal and to erect a big plant at Chittenden for the manufacture of the product. In order to get reasonable rates of transportation to tide water, negotiations have been opened with W. J. Rogers of San Francisco for the purchase of the electric line to Port Rogers, owned by the Watsonville Transportation company.

SKETCH OF THE ORIGINATOR OF THE CEMENT BLOCK INDUSTRY.

Harmon S. Palmer is unquestionably the originator of what is correctly described as "a revolution in building methods." He stated to a reporter at the convention of blockmakers, at Indianapolis, "that it had always been his desire to be of some benefit to mankind and to produce something by which he could realize that such had been the case, and as he looked over the convention, which was the outcome of persistent effort during twelve years of consistent toil and expense, unaided and alone, he could not but feel a just pride when he saw so many that are now willing to acknowledge the merits of hollow block construction, and so many who seemed to be trying to get around his patents.



Harmon S. Palmer, Inventor of the Concrete Building Block.

Mr. Palmer, from childhood, has been an inventor, but like many others, has wasted time and money on schemes and theories only to find at the end that his energies had been misapplied and that the results were not appreciated by the public. In early life many patents were secured by him for improvements in farming implements, a knowledge of which he secured by daily contact in the field; he having been born and raised on one of the fine farms of Southern Michigan, Jackson County. It was here in the year 1872 that he invented the non-decaying fence post, the bottom of which was brick clay and afterwards *concrete*, on both of which he secured patents and was quite successful in that line of business. Thus it will be seen at this early day his conception of the possibilities of concrete to the needs of mankind were well founded.

At the age of eighteen he engaged in the contracting and building business, an occupation to which he was well adapted, and by which he became fitted for perfecting the details necessary in using concrete for building purposes, which gradually drifted to hollow block construction. He became familiar with the characteristics of all building materials as well as their cost and relative value. He learned the requirements of building construction in shapes and sizes of brick and stone.

He was at one time a large contractor in sidewalks and pavements, and several cities of the South have miles of his work on which is stamped, "Laid by the H. S. Palmer Art Stone Co."

But as the price of cement sidewalks declined, more attention was given to building houses with the same material, and as Mr. Palmer was always known as an aggressive competitor it was but natural that he should devise some means to cheapen his work and underbid his rivals; for this purpose the hollow block system was planned and finally brought to a successful issue, which was at once grasped by the building public as one man, and within three years has gone over the whole world like a flood tide.

It is needless in this article to describe the various ways and means which were used at various times to accomplish the results needed to make a success of hollow blocks; but there was one difficulty which had to be overcome, and that was a machine which would make the blocks. This, Mr. Palmer invented without a hint or suggestion from any person or printed matter whatsoever. It was entirely original, and to this day nothing has appeared which is an improvement on his machines or blocks, and of all the various devices for this purpose none have left the original conception and principles—so that all blocks are Palmer blocks to a greater or less degree of similarity the one with the other, each carrying a slight variation of the same idea.

It should be borne in mind that what now looks so easy was in reality quite hard to accomplish, and required much study and expense. Years were necessary to convince men with money that loans were safe on such houses and money had to be procured in other ways and invested in these new buildings solely on the faith of the inventor, and to say the least, many discouraging periods were passed; but, like all other improvements which have come to benefit mankind, some one had to be the pioneer, stand the brunt, expense and ridicule. In this case it was Harmon S. Palmer, but the reward is not wanting, and he feels that his success in life is merited by persistent push and energy in the right direction.

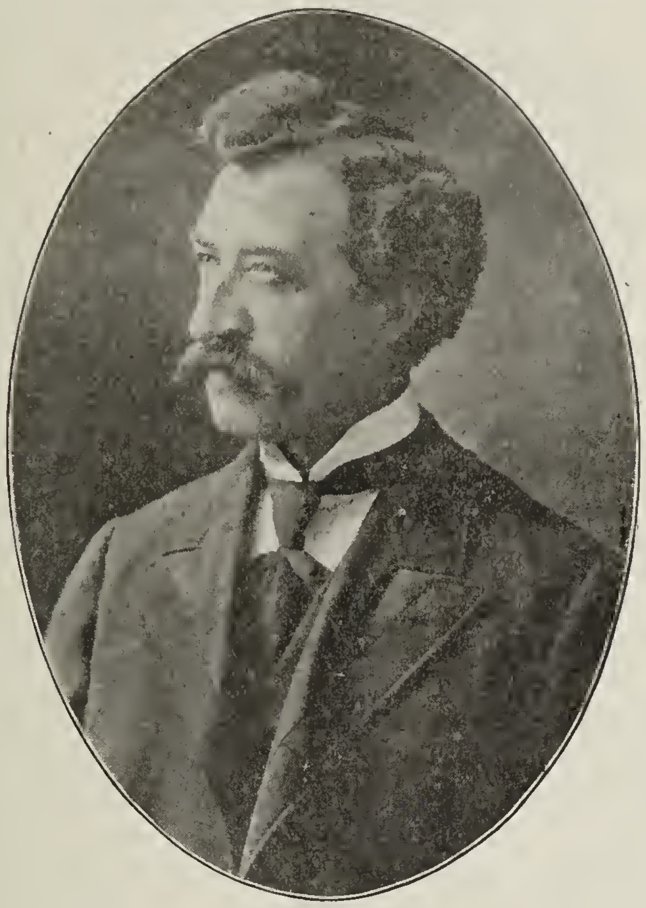
In view of the immense display at the convention at Indianapolis of blocks and machines, and the acknowledged merits of the industry throughout the world, and that for three years the ingenuity of the country has been directed to improving the hollow block industry; having a practical machine to start with, and no advancement of merit has yet appeared, it is certainly an evidence that Harmon S. Palmer is one of the master minds of the age in his chosen field.

Mr. Palmer lives in Washington, D. C., in an elegant home made out of his patented hollow blocks. He is president of the Harmon S. Palmer Hollow Concrete Building Block Co., and his two sons, Floyd and Clyde, are respectively, vice-president and secretary. Their business has grown to great proportions and there is hardly a country on the globe in which some of their machines have not been introduced.

ANTON BERG AND HIS PRESS.

The Berg Press is being introduced into Canada. Mr. Anton Berg, its inventor, attended the convention of the Ontario Clayworkers' Convention, at Waterloo, Ont., resulting in plans to manufacture the press and push its sale in the Canadian clayworking field.

We submit a few facts pertaining to Mr. Berg personally, which will be of interest. Mr. Berg came from Norway, leaving there eighteen years ago, where he had the advantages of an excellent education and training in mechanics, to Chicago, taking a position with the McCormick Harvester Co. His mechanical ability attracted attention and he became an assistant to the master mechanic in developing inventions. A few years later he accepted a similar position in a machine shop where a number of brick presses were under construction, and he was subsequently put in charge of the brick machinery department. When the company for whom these machines were being built erected its own factory for the manufacture of brick machines, Mr. Berg was engaged by it to install the machines, besides taking active part in superintending the building and erecting work of the company, holding the position several years, Mr. Berg always taking great interest in dry pressed brick machinery and a firm believer in its development.


Anton Berg.

In 1897 a patent was applied for on the Berg brick press, and a model of this invention was exhibited at the Nashville Exposition. The first Berg press was placed at Millsdale, Ill. About five years ago Mr. Berg arranged to have the press built on a royalty by a well-known Indiana concern.

Two years ago Mr. Berg visited Europe, built a machine, installing it in a brick plant in Norway, resulting in successful operation. The dry-press system is comparatively new in Europe and its successful operation has attracted much attention, resulting in Mr. Berg receiving offers for the patent rights on the machine from nearly all the European countries.

In Scandinavia, at the present time, the clayworking journals are devoting much space to the discussion of the possibilities of the dry-press methods in the manufacture of brick, growing out of the latest Berg installation.

In 1904 Mr. Berg spent about six months in Canada investigating the Canadian clayworking market. The Bertram Engine Works, Toronto, Canada, are now building the Berg presses and several other patented devices for brick-making, and this firm is now in position to take care of all orders that may be presented. The Bertram Engine Works already has a high reputation in the Canadian machinery world and has a fully-equipped machine shop and boiler works. Contracts are already on hand for a complete sand-lime brick plant for the Manitoba Press Brick Co., Winnipeg, one dry-press brick plant for John Watson, of Calgary, and contracts have also been closed with La Prairie Brick Co., of La Prairie, Quebec, for one Berg press for immediate shipment, and three more to follow later. The Berg press has stood the most severe tests and is in the front rank among the dry presses. It is built for hard and steady work, and is in successful operation in all parts of the United States.

Mr. Berg personally is a man of sterling character, and his mechanical ability is acknowledged. He is now engaged in soliciting contracts for complete plants, furnishing all the material and placing it in successful operation. Address correspondence to Anton Berg, Bertram Engine Works, Toronto, Canada.

Bertram Engine Works, Toronto, Can.

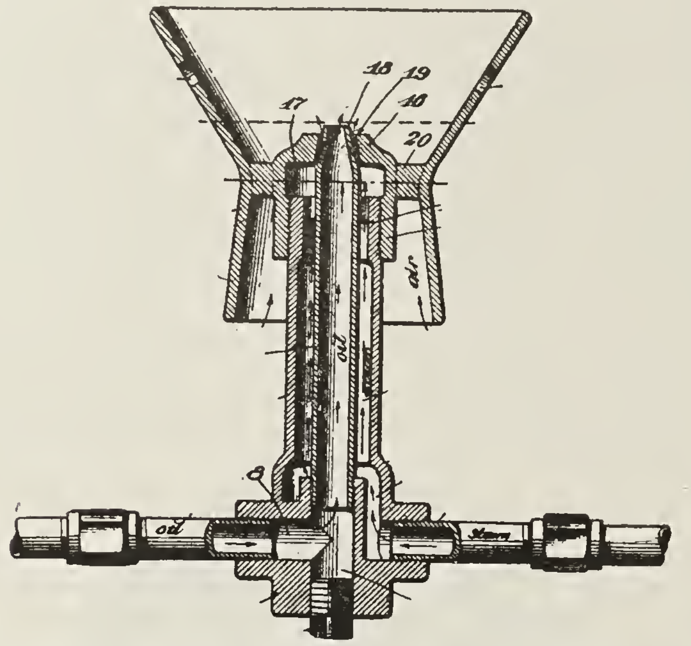
TO MAKE BRICK FROM ASHES.

The Ash Fire Brick Co. has been organized with a capital stock of $40,000, to manufacture a new fireproof building material invented by Chas. R. Berry, of Howlett, Mich. The incorporators are Berry, Theodore L. Smith, Sinclair Harcus, George Skeleton, Charles F. Hunt and William H. Perkins, all of Detroit.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

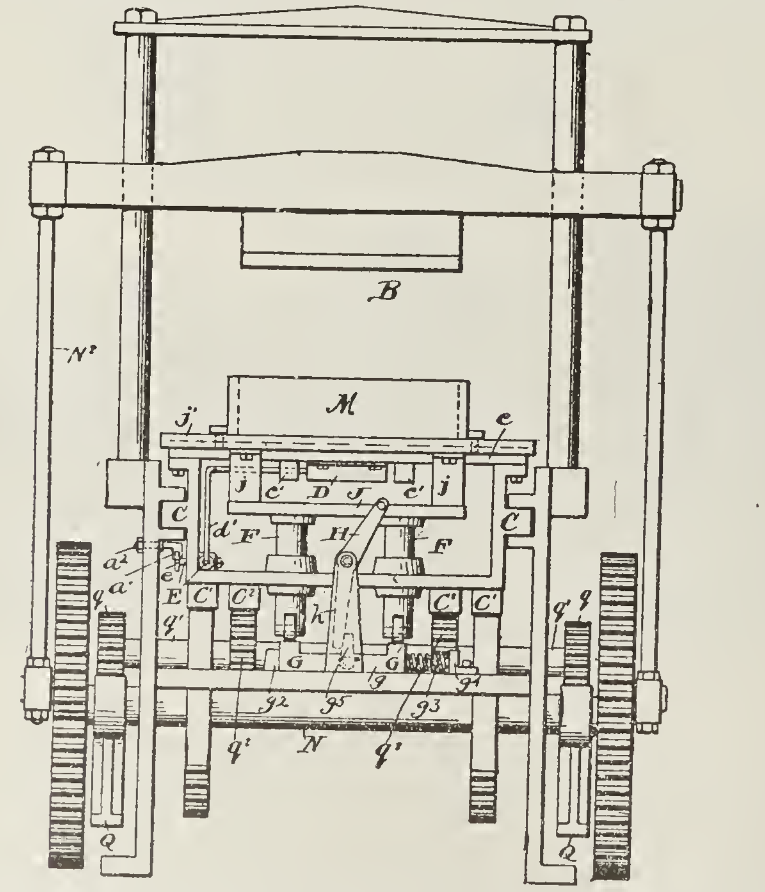
These new inventions are those that are especially of interest to any one engaged in the line of building materials and their manufacture, or machinery to make them.

784,126. Hydrocarbon-Burner for Brick-Kilns. John Schurs, Los Angeles, Cal. Filed Apr. 6, 1903. Serial No. 151,225.



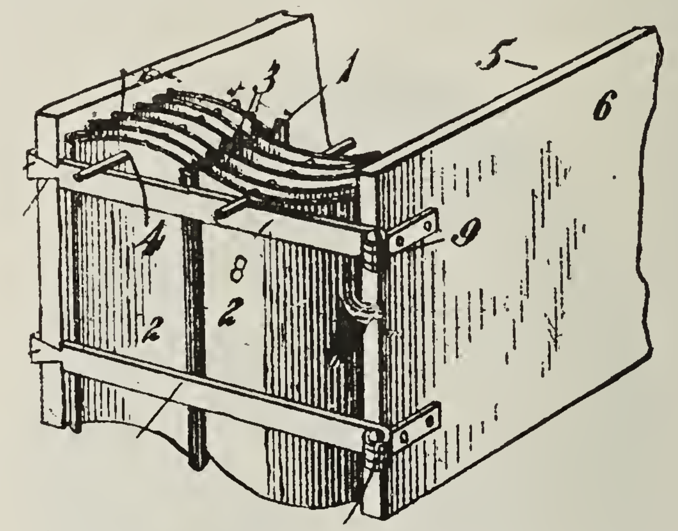
Claim.—1. In a hydrocarbon-burner, a hollow cylindrical body provided with means for feeding steam thereto, and having its forward end closed and provided with longitudinally-arranged perforations, a flaring hood on the closed end of said body having a central portion open at one end to engage and fit over the forward end of said cylindrical body and having a perforated wall at its forward end, said hood being provided with ribs connecting it with said central portion and the said central portion having a chamber between its ends forming an expansion-chamber in communication with the perforations of the body and of the central portion, and an oil-pipe through said body with its forward end projecting through the perforations of said central portion.

784,536. Molding-Machine. John N. Battenfeld and Harriet A. Battenfeld, Cleveland, Ohio, assignors to The Berkshire Manufacturing Company, Cleveland, Ohio, a Corporation of Ohio. Filed Feb. 25, 1904. Serial No. 195,267.



Claim.—In a molding-machine, the combination with a reciprocating bed, a press, a pattern-plate carried by said bed, a vibrator carried by said plate, valve mechanism carried by said bed for controlling said vibrator, and means for operating said valve mechanism to start the vibrator as the bed is leaving the press and for turning off the pressure before it reaches normal or rest position.

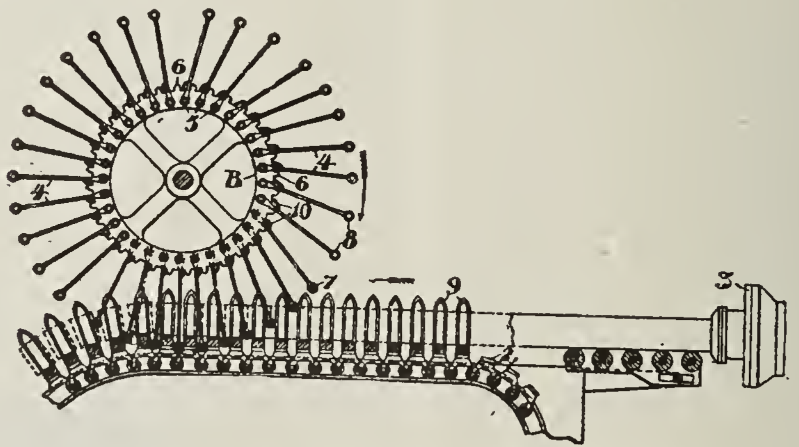
785,636. Mold for Molding Roofing or Other Tiles. Frank M. Sawyer, Charlotte, N. C. Filed Dec. 22, 1904. Serial No. 237,948.



Claim.—A mold of the class described comprising pieces provided with notches in their opposing sides and transverse pieces to connect the first-named pieces and adapted to have their edges inserted in the notches of the first-named pieces, whereby said transverse pieces are spaced apart by the said notched pieces, the width of the notches of the latter exceeding the thickness of the transverse pieces and thereby serving to form the side edges of the molded articles.

A mold of the class described, comprising longitudinal pieces, transverse pieces to connect them together, means to space said transverse pieces, the latter having openings and a rod in said openings and removable from said transverse pieces to form openings in the articles molded in the spaces between said longitudinal pieces and said transverse pieces, substantially as described.

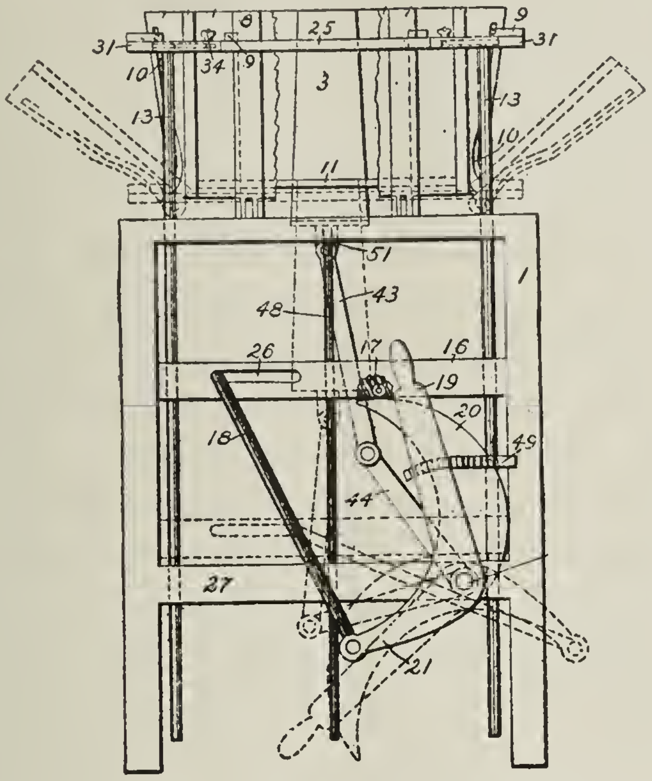
786,003. Brick or Tile Cutting Machine. Charles R. Codding, San Rafael, Cal. Filed Sept. 12, 1904. Serial No. 224,231.



Claim.—In a brick and tile cutting machine, a cutter comprising a rotatable support, radially-disposed frames pivoted on said support, cutting-wires carried by said frames, means for limiting the arc of movement of the frames about their pivots and springs fixed to and removable with the frames as a unitary structure, said springs coacting with the support to turn the frames on their pivots.

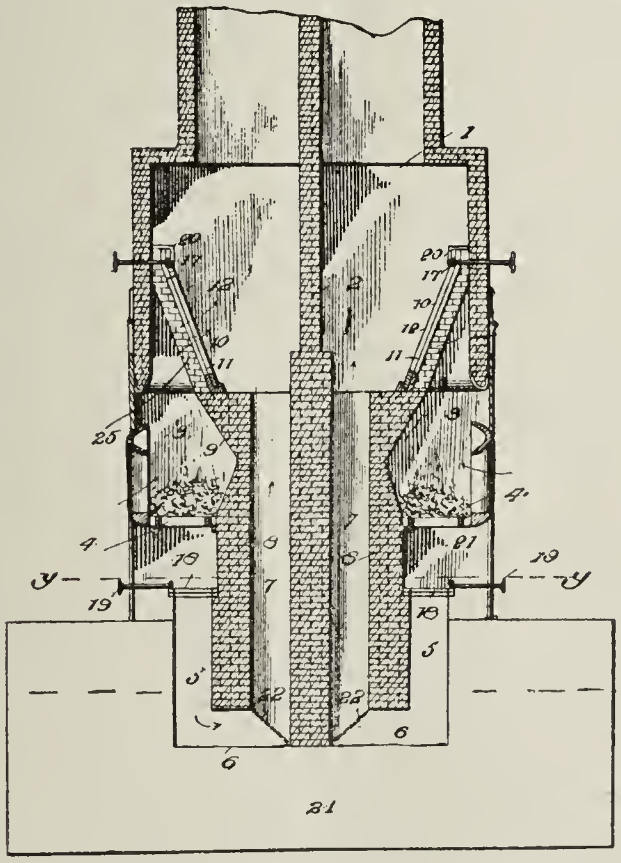
In a brick and tile cutting machine, a cutter comprising a rotary support having radially-disposed pivoted frames, cutting means carried by the frames, said frames having a limited arc of movement about their pivots independent of the movement of their support and springs fixed to and removable with the frames as a unitary structure and coacting with the support and independent of the force of gravity to turn the frames about their pivots in the direction of rotation of the support.

786,251. Machine for Forming Concrete Building-Blocks. James F. Dunham, Waterloo, Iowa, assignor by mesne assignments, to Waterloo Concrete Brick & Block Machine Company, Waterloo, Iowa. Filed Oct. 6, 1904. Serial No. 227,395.



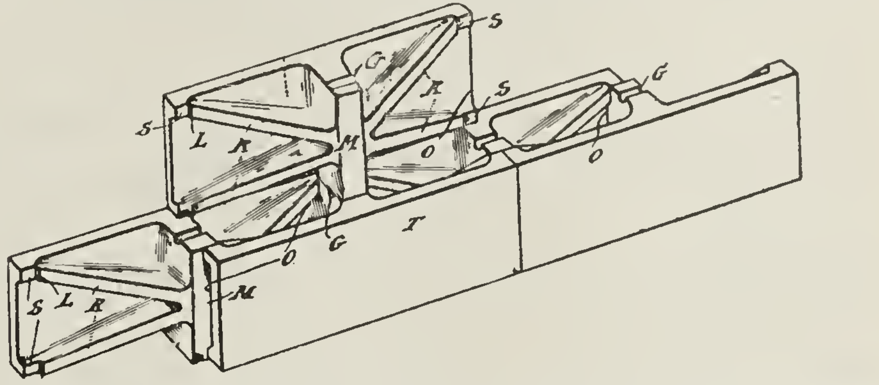
Claim.—A machine for forming concrete building-blocks, consisting of a mold having pivoted drop sides and ends, means for adjusting the width apart of said drop sides, a removable bed-plate, cores, means for reciprocating said cores, and an adjustable closing rack, surrounding said mold provided with means for being reciprocated in synchronism with said cores, substantially as described.

786,196. Chimney Construction. William T. Coughlin, Bessemer, Ala. Filed June 2, 1904. Serial No. 210,882.



Claim.—In chimney construction, and in combination, a heater, a chimney extending upwardly from the heater, a transverse partition-wall disposed in rear of the heater, vertical downdraft-flues extending downwardly from beneath the heater in front of the partition-wall aforesaid, vertical updraft-flues extending from the down-draft-flues aforesaid and located in rear of the partition-wall above mentioned, a damper resting at its lower end upon the upper portion of the partition-wall and having the upper end resting against the front wall of the chimney, said damper being disposed above the heater and adapted to establish or cut off a direct draft therefrom, spaced fire-brick partitions beneath the said damper, and a second damper disposed beneath the heater to establish or cut off a downdraft therefrom.

786,762. Building-Block. Charles J. W. Hayes, Detroit, Mich., assignor to Charles W. Cadwell, trustee, Windsor, Ontario, Canada. Filed Oct. 17, 1904. Serial No. 228,717.

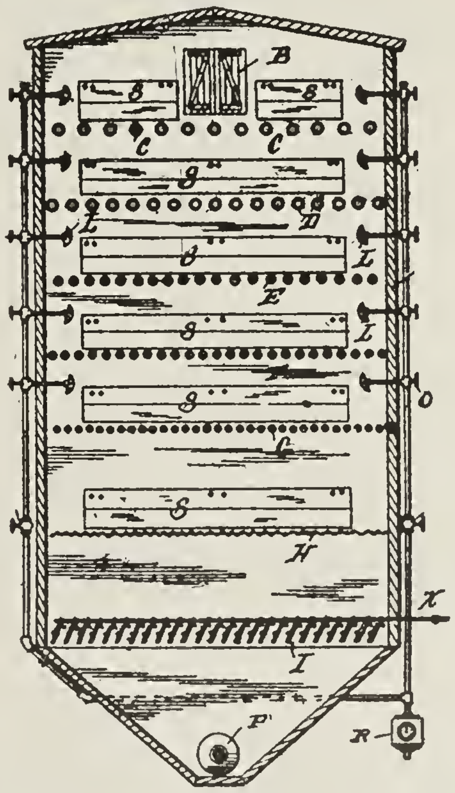


Claim.—A building-block constructed with a transverse rib and with ribs radiating from the central portion thereof to the ends of the block, substantially as described.

As a new article of commerce, a building-block having a tabular part and a transverse middle rib, and ribs radiating to the ends of the block from the central portion of such transverse middle rib, substantially as described.

785,725. Lime-Digester. Lincoln E. Fishack, Toledo, Ohio. Filed Feb. 17, 1904. Serial No. 193,941.

Claim.—1. In a lime-digester, an inclosing shell or casing, a series of gratings of increasing fineness from the top toward the bottom arranged within the casing, and sprinklers arranged to direct a spray on the lime as it falls from grating to grating, all combined.



In a lime-digester, an inclosing shell or casing, a series of gratings consisting of parallel bars without cross-bars arranged within the casing, the grating increasing in fineness toward the bottom of the digester, and means for conveying a spray to the lime on the gratings, all combined.

In a lime-digester, an inclosing shell or casing, a series of gratings within the casing and increasing in fineness toward the bottom, openings in the casing at the end of each grating whereby debris may be removed and means for introducing water to the lime on the gratings, all combined.

An organized structure for digesting lime, consisting of a casing or housing to confine steam to a considerable extent therein, a series of gratings within the casing, means for removing slaked lime from below the lower grating, and means for feeding water in regulated quantities to the lime on the gratings, all combined.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

Clay Record Publishing Company,
Ninth Floor, Plymouth Building,
303 Dearborn Street,
CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.
Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

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Vol. XXVI. APRIL 29, 1905. No. 8

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

Clay Record—semi-monthly—one dollar yearly.

Statistics can be made to show any old thing that the man behind the figures wants them to.

He that wrestles with us strengthens our nerves and sharpens our skill; our antagonist is our helper.

Truth is tough. It will not break like a bubble at a touch; nay, you may kick it about all day, like a football, and it will be round and full at evening.

As a result of the tests of Prof. Woolson, referred to elsewhere, a standard set of specifications is announced for determining by test for use in New York of sand-lime brick, concrete block and artificial stone products of various kinds. We believe this is the first attempt to give these newer materials a recognized standing and place among building materials, and means that they will be extensively used in the future in certain classes of building work. At present there is no standard by which their suitability and efficiency can be judged, and manufacturers and possible users are suffering because of these facts.

There is scarcely anything more interesting to engineers, and certainly nothing more entertaining to them, than tests of common brick, and their attention is called to the tests described by Prof. Ira H. Woolson in another column. Notwithstanding the wide use of this material and the accumulated data concerning it, engineers in their researches run against the fact that there are almost no reliable data of its strength and durability.

Prof. Woolson, of the Bureau of Buildings of Manhattan Borough, New York City, has undertaken to remedy this deficiency, and in the tests recorded (referred to above) the results of his labors may be noted and will be found decidedly interesting, if not embodying definite final conclusions, there has been given in the results obtained sufficient proof that we need to revise our data on the physical characteristics of common brick. Take the figures of transverse strength given in text-books, these the Professor finds too high; his tests show results from 20 to 50 per cent lower than the figures given in engineering books. Again, the results obtained by Prof. Woolson indicate that there is no conformity between transverse and crushing strengths, or between strength and absorption. The tests indicate also that common brick of good average stock will give an ultimate compressive strength of nearly 4,000 lbs. per sq. in. They show further that this strength is generally reduced by the absorption of water by the brick; over 70 per cent of the brick tested wet showed a decrease in strength varying from 10 to 45 per cent. The absorption tests brought out the fact that the bulk of the water absorbed is taken in within the first half hour of immersion; that after 48 hours the amount of water absorbed is very small, less than one per cent of the total absorption. Another interesting detail is that the absorption is always as great and sometimes is greater when the brick is only partly submerged. Prof. Woolson recommends only partial immersion in making absorption tests, arguing that this represents more closely than does complete immersion the actual conditions of a rain wetted wall, and also that it makes possible a study of the brick to stain or effloresce.

The results of the fire and the freezing and thawing tests are inconclusive, and, as Prof. Woolson points out, are open to criticism in some particulars.

It must be admitted that common brick is a remarkable resistant material, even under the most severe attacks of heat and cold, and we endorse the Professor's concluding suggestion that the whole method of testing bricks should be standardized.

FIVE BERLIN BRICK YARDS CLOSED.

Five Berlin, Conn., brickyards are now closed as a result of a strike among the brickyard laborers. About 200 men are out. They want an increase in wages of from $2 to $6 per month. The yards affected are the Donnelly, Towers Bros.', Richard Murray's, Standard and R. C. Clark's.

ACCIDENTS, DAMAGES AND LOSSES.

The Volant (Pa.) Clay Mfg. Co. have been forced into involuntary bankruptcy. The amount of their indebtedness is $2,415.90.

F. G. Banker, a wealthy brick manufacturer at Greenfield, Ind., has deserted his family and business and gone to parts unknown.

George Allbrecht has been appointed receiver of the Midlesboro (Ky.) Pressed Brick Works. The liabilities are $7,000, assets $24,000.

A verdict has been given against the Capital City Brick & Pipe Co., Des Moines, Ia., for $3,500 for the death of Natalie Chiesa, who was killed at the plant.

By agreement Judge Paulus dissolved the partnership which has controlled the Marion (Ind.) Clay Pot Co. The dissolution was brought about through ex-parte proceedings.

The property of the Wick China Co., Kittanning, Pa., was sold on an order from bankruptcy court to James Crawford, presumed to represent the Colonial Bank of Pittsburg, for $50,000.

Sheriff Swain has sold the plant of the Daleville (Ind.) Brick Co. to J. J. Johnson of Indianapolis, Ind., for $2,130, the amount of a note and interest held by the Union National Bank of Muncie.

The case of the Geo. C. Murphy Pottery Co., East Liverpool, Ohio, against the C. & P. Ry. for $105,000 damages for burning of pottery, is to come up in the United States court at Cleveland this month.

While constructing a brick kiln at the Park Brick Works, Crow's Run, near Beaver, Pa., R. J. Smith, of New Brighton, and Joseph Caulson, of Freedom, were injured and removed to their homes in an ambulance.

PHILADELPHIAN BUYS CLAY WORKS.

Carlisle, Pa., March 18.—The Philadelphia Clay Works were scold to-day at public sale. The plant is located at Hunter's Run, this county, and was sold to obtain a clear title. M. W. Phillips, of Philadelphia, the purchaser, bid $150,000 for the property.

PORTER BRICK PLANT DESTROYED BY FIRE IS BEING RECONSTRUCTED.

The works of the Chicago Hydraulic Press Brick Co., at Porter, Ind., are to be rebuillt in such a manner as to insure immunity from further destruction by fire.

October 21st the entire plant was consumed by fire; only the office, barns and isolated clay sheds remain, together with fourteen kilns, which were indestructible. The entire building construction as now adopted and under way, is of the most substantial character. Heavy brick walls, brick partitions and brick fire walls are to be constructed throughout the plant. The entire plant will be one of the finest in the west.

The work of reconstruction of building, installing of machinery and getting under way in the actual manufacture of brick is to be executed as rapidly as men and money can do it.

OLDEST POTTERY IN NEW JERSEY TAKEN DOWN.

The Haddonfield Pottery, the oldest in New Jersey, is a thing of the past. The old brick building together with the kiln located on Potter street, have been torn down. Work at the place was carried on continuously for about one hundred years. The manufacture of pottery ware was commenced in the building March 15, 1805, by John Thompson, who carried on the business of making earthern ware until 1817, when Richard Snowden, father of William H. Snowden, who had learned the trade under Thompson, bought his father's interest and carried on the business successfully until 1868, when he sold it to his son Richard, who in turn carried on the manufacture of pottery until 1883. After this the property was leased, the first lessee being Barton Nicken, who held it for four years, when Weingender Brothers took possession of it and held it until about the end of last year, when work ceased at the place for the first time in about one hundred years.

Nothing but plain earthenware was manufactured at the pottery before 1881, when Richard Snowden built a kiln for making stoneware. This kiln was very satisfactory and much desirable ware of this kind was turned out at the place by Weingender Brothers. All the clay used by the potters was ground by horse power. The lot will be cleared to make room for the erection of a dwelling house.

BALTIMORE BRICK CO.'S STATEMENT.

At the annual meeting of the Baltimore, Md., Brick Co., a Delaware corporation, the following directors were elected: John G. Gray of Wilmington, Del.; Charles F. Macklin, Samuel R. Busey, Charles H. Classen, Joshua Levering, Douglas H. Gordon, Richard Cromwell, Jr., T. W. Claggett and William H. Bosley of Baltimore.

Following is a statement of its operations for the year ended on March 31, 1905: Gross earnings for 12 months, $860,438.99; expenses (including taxes), $703,617.76; net earnings, $156,821.23; other income, $3,526.97; total, $160,348.20. Surplus of April 1, 1904, after deducting bond interest to April 1, 1905, $5,000 for contingent reserve for bad debts, and $25,000 for depreciation, etc., $3,292.60; total surplus April 1, 1905, $163,640.80.

BRICK COMBINE RENEWS HIGH PRICE AGREEMENT.

There will be no change in the price of common brick this season. This was determined at the annual meeting of the Denver (Colo.) Brick Manufacturers' association, held last Wednesday. All of the old officers were re-elected, with A. J. Baker as president, and it was determined to continue the local price agreement which has been in force for a year. The present agreement will expire May 1, and will then be renewed for another year. Present prices for brick are $5.50 for salmon and $6.50 for hard, delivered.

It was thought for a time that the local combine would be dissolved as a result of the withdrawal of the pressed brick men some time ago, but this is not to be the case.

BIG DEMAND FOR BUILDING BRICK.

"Probably never before in the history of the Standard Fire Brick company, Pueblo, Colo., have the orders for brick been so heavy as at the present time," said Superintendent F. L. Capers of that plant in discussing the condition of the works.

For the last several months the plant has been working at full capacity, the orders for brick from all parts of the west which have been coming to the local industry have increased in volume until it has been found necessary to materially increase the working force of the brick plant and a large number of new employes are being hired and placed on the payrolls of that institution.

It seems that there is a great demand in the western states for Colorado brick, especially that which is manufactured in Pueblo. The demand for building material comes not only from Colorado points, but from Kansas, Missouri, Utah, New Mexico and other western states. The many new residences that are being projected in Pueblo will require an enormous quantity of bricks and it is probable that the local plant will be taxed to its utmost to supply the ever great demand.

A BRICK PLANT AT BUFFALO TO COST $150,000.

A deal has been completed that decided that Wilson county, Kansas, will have the largest brick plant in the west. The plant is a short distance north of Buffalo. Through C. B. Amyx as agent for the lands on which the plant is located, a party of Omaha men selected the location and are now in the act of constructing the plant. The total cost of the plant will be $150,000, half of which will be for new machinery. The switch to the site of the plant has already been laid. D. B. Zimmers, who is at the head of the company of Omaha men who organized this company, has been in Chanute for several days on business. Some of the features of the plant's machinery is a 500-horse power engine, twenty-four dry kilns, waste heat system, and electric motor power. The capacity of the plant is sixty million brick a year. It will employ 115 men.

J. W. Pratt, of Chanute, has the contract for the plans and specifications. Mr. Amyx has been working on this deal for six months.

MACK COMPANY OPENING UP NEW VEINS.

The Mack Manufacturing company, New Cumberland, W. Va., is engaged in opening up several new clay mines at the different works, opening up what is known as the lower vein which is about on a level with the railroad. It has already opened up the mine at the Union works, finding about 12 feet of very good clay which is mixed with the other coming from the upper vein, thus overcoming any bad effect, if there should be any in the quality of the brick made from this clay taking it alone. Care is taken to keep up the superior quality of its output, to the standard of perfection attained by this company in that as recognized in the "Mack Block." This is not an experiment in the use of this vein of fire clay, for the company has used it before, with the very best results, making a class of brick not surpassed.

LUNDY BOUGHT BRICK PLANT.

H. S. Mizner, of Knoxville, and C. T. Lundy, an expert in the brick industry, are now the owners of the McCroskey Mining and Manufacturing company's property at Lonsdale, having purchased it from D. P. Monaague, of Chattanooga, who confirmed it at chancery biddings. Messrs. Mizner and Lundy will take steps at once for the operation of the plant and will as soon as practicable enlarge its capacity.

The McCroskey Mining and Manufacturing company was organized in Knoxville last summer by Maj. E. E. McCroskey, John F. Horne and other business men of Knoxville. The plant was constructed at Lonsdale and every effort was made to make the venture successful, C. T. Lundy, a practical superintendent of brick plants in the north, having been chosen as superintendent of the Lonsdale plant. Mr. Lundy took active control of the plant and made every effort to make the operations of the company successful, but being a new venture the plant went into the hands of a receiver. Mr. Lundy remained in the city, however, and having had faith in the plant and Knoxville as a point at which to manufacture bricks, concluded to become part owner of the works and has therefore secured a partnership in the plant.

The new owners have not yet decided as to what will be the complete business course in the manufacture of bricks which will be pursued by them. They have, however, decided to enlarge the capacity of the plant; in fact, to almost double the amount of its operation, and will, as soon as the plant will have been put in operation again, manufacture red as well as facing brick. The McCroskey Mining and Manufacturing company made only fancy brick and was the only plant of its kind in the south. The most beautiful kinds of facing brick were made at the plant at Lonsdale and the brick was becoming popular throughout the country, when the company went into the hands of a receiver.

The capacity of the plant was about 20,000 facing brick a day, and it is the hope of the present owners to enlarge the plant to a capacity where from 40,000 to 50,000 of both fancy and red brick may be manufactured every day. The company will employ the services of forty or fifty men. The company now has about 600,000 fancy brick lying in piles at the plant, and these brick will be disposed of shortly before the plant begins operation, or at least a part of the number will be sold.

C. E. Lundy, who is one of the owners of the concern, is of the opinion that the plant may now be operated successfully.

A NEW PATENT-SHALE CURB.

A new curb, made of shale, and matching in color and appearance with the brick used for street paving has just been patented by the Windsor Brick Company of Akron, O., and bids fair to become a great thing. Blue prints of the curb were exhibited at the Board of Public Service, and the company is desirous of making a number of tests to prove the curb in this city on streets to be paved this year.

The curb is made of the same material as the paving brick and in sections of any length desired. It has in it three or four holes in which, when the curb is laid, rods of steel are embedded in concrete to hold the joint from sagging as stone curb often does, if something goes wrong with the bed or filler back of the curb. One of these holes can also be used as a conduit for electric wires if a city at any time wishes to remove these from overhead poles.

The claims made by the Windsor Brick Company for the new curb are that it is stronger and better in every way than the stone curbing and more nearly matches the street paving.

WEALTHY BRICKMAKER LEAVES FAMILY.

F. G. Banker, a wealthy brick manufacturer of Greenfield, Ind., reputed to be worth at least $100,000, has deserted his family and business and gone to parts unknown, accompanied, it is said, by Mrs. A. J. Rice, wife of a laborer. In a letter to his wife, Mr. Banker asks her to forgive and forget him, adding that, owing to differences that had arisen, he was sure that they never could be happy together again. Inclosed in the letter was a check for $200 on a local bank, and deeds to his two pieces of property, also one of the brick works and the fifty acres of land on which it was situated, worth several thousand dollars. There was also a letter to his son, who is twenty-one years old, advising him to continue the business. Banker is the father of two children, and Mrs. Rice is the mother of two. A. J. Rice brought suit against Mr. Banker for alienating his wife's affections, and the plaintiff recovered judgment for $2,000 damages.

Mr. Banker is forty-two years old. He was the first president of the Indianapolis and Eastern interurban railway, in which he holds considerable stock. He also held $3,000 worth of stock in the Utah Valley irrigation project, and it is supposed that the runaway couple has gone to Utah. It is also believed that the two small boys of Mrs. Rice have gone with them. Mrs. Banker will make no effort to apprehend her husband, but she is firm in her determination not to apply for a divorce.

SOLD PATENT FOR BURNING BRICK.

The letters patent on a device for burning brick with coal, instead of wood, were sold at the court house at Newburg, N. Y., recently, by Attorney A. H. F. Seeger. The patent was granted to Jerome Walsh and the late Elijah A. Walsh, by the United States Patent Office on Dec. 15, 1903, and has about fifteen years to run.

The device in question has been tried at Walshville and is said to have resulted successfully. Mr. Seeger, who conducted the sale, represented Jerome Walsh. Attorney Elmer E. Roosa, representing half-brothers and sisters of the late Elijah A. Walsh, was also present.

The first bid was $5, from Harry McDowell of Attorney Seeger's office. Mr. Roosa then bid $10, and the bidding was run up by these two men, to about $400. Then both dropped out and Hiram H. and Jerome Walsh bid against each other. The patent was finally sold to Hiram H. Walsh for $1,000.

OFFERS CANAL LAND GRATIS.

A syndicate composed of Bernard Weber, Fred W. Labahan, Louis Reimer and Henry Busse, of Chicago, made a proposition to the drainage board to build one-half mile of the proposed north branch extension—the section between Emerson street and Pratt avenue—donate the land necessary for the right of way for the channel and do the work under the direction of the sanitary district engineers without expense to the taxpayers. It is estimated the work will cost $75,000. The compensation asked by the syndicate is that it be given all the clay excavated along the four miles of the channel. The syndicate proposes to erect a big brick manufacturing plant on the banks of the new channel.

POTTERY NEWS ITEMS.

The Tullahoma (Tenn.) Pottery Co., Geo. E. Glover, manager, has installed a pottery.

W. B. Cosgrove and others, Zanesville, Ohio, have bought the Chas. Upjohn pottery for $8,000.

The Harley Pottery Co., Nashville, Tenn., is enlarging their plant and doubling its capacity.

Henry Florin, of Thompson Falls, Mont., is now building kilns and expects soon to have a pottery in operation.

A number of well known Toledo, O., capitalists are now organizing a $150,000 company to erect a pottery at Oak Harbor.

A party of San Francisco, Cal., capitalists are said to have under consideration a proposition to establish a pottery at Ione, Amador Co., Cal.

The D. Culbertson Stoneware Co., Whitehall, Ill., has been incorporated with $40,000 capital stock by D. Culbertson, R. S. Worcester and W. L. Winn.

The Barberton (Ohio) Pottery Co. has been incorporated with $150,000 capital stock, by A. W. Blackburn, John McNamara, M. O'Neil, H. B. Camp and J. E. Good.

The Quaker City Pottery Co., Camden, N. J., has been incorporated with $50,000 capital stock, by Edward McQueeney, C. McQueeney and Paul S. Murta, all of Camden.

The Haddonfield (N. J.) Pottery, the oldest in New Jersey, is a thing of the past. Work at this plant was carried on continuously for 100 years, commencing March 15, 1805, by John Thompson.

The charter for the Buckeye Pottery, Macomb, Ill., has been surrendered and the proprietor, W. J. Pech, has taken as partner his son, C. Arthur Peck, and the firm will be known as W. J. Pech & Son.

Muskogee, I. T., is to have a pottery company with $10,000 capital stock. Judge Baker and a Mr. Goddard, a practical potter, is to own 60 per cent of the stock. The plant will employ 40 men.

The Palouse (Wash.) Pottery Mfg. Co. has been incorporated with $50,000 capital stock, by C. H. Patton, A. J. King, H. M. Swartwood and G. M. Swartwood. The new company will take over the Palouse pottery and will install new machinery.

Plans have been prepared by East Liverpool and Canton, Ohio, capitalists for a $100,000 pottery for Canton that will employ 500 men. Among those interested are Herman Feustel, a practical potter, and A. E. Czech, a business man of East Liverpool, and John C. Harmony and Attorney S. H. Maneral, of Canton.

Tom Swinger, Hannaford, S. Dak., will put in a tile factory as soon as machinery can be had.

E. Walther, of Milwaukee, Wis., has started his brickyard at Underhill, Wis.

Marvel & Grady, Kennett Square, Pa., have erected a 100,000 daily capacity brick plant in the old Worrall & Keating property. A complete Chambers Bros'. outfit was installed.

SAND OR LIME-BRICK OR BLOCK NEWS.

H. A. Pinch, Waukon, Iowa, is trying to establish a sand-lime brick plant at that city.

Fred Leusch has decided to locate his cement machinery and shingle plant at Toledo, Ia.

The Perrin Cement Machine Co., Columbus, O., has been incorporated with $10,000 capital stock.

Capt. W. T. Becker, of Menomonie, Wis., is trying to organize a sand-lime brick plant at Eau Claire, Wis.

The Waterloo (Ia.) Concrete Brick & Block Machine Co. has completed the addition to its manufacturing plant.

The Fond du Lac (Wis.) Cement Brick Mfg. Co. expect to begin making brick at their new location the first of May.

The Sebewaing (Mich.) Sandstone Brick Co's. plant is again running after an installation of a new brick machine.

Oglesby & Kelly, Rushville, Ind., have increased the capacity of their brick-making plant and put in a cement block machine.

The Houston (Texas) White Brick Works, which has been under construction for several months, is now ready for operation.

One of the artificial stone companies of Fremont, Neb., has put in machinery to manufacture brick, using sand and cement as for cement blocks.

Work on the plant of the Red Wing (Minn.) Brick Co. is progressing rapidly. Supt. J. J. Bovy says the plant will be ready in three weeks.

The Tri-City Sandstone Brick Co., Moline, Ill., has been in corporated with $60,000 capital stock. The incorporators are B. F. Peck, C. E. Dietz and G. A. Shellberg.

Work on the placing of the machinery in the plant of the Waterloo (Ia.) Granite Brick Co. is progressing rapidly and the plant is expected to be in operation the fore part of May.

The Cedarville (Ind.) Artificial Stone & Cement Co. has been incorporated with $25,000. Directors, A. C. Bettinger, C. C. Adams, C. H. Thomas, E. R. Gesaman and Amos T. Houk.

The Cement Ventilating Building Block Co., West Rich street and Ohio Central railway tracks, Columbus, O., is preparing to build their plant. H. L. Moar is president, O. S. Marckworth general manaegr.

The Plant City Granite Brick Co., Plant City, Fla., has been incorporated with $30,000 capital stock. I. W. Phillips of Tampa is president, P. A. Merrin vice-president, and J. L. Young of Plant City secretary and treasurer.

The Sandy Hill (N. Y.) Brick Co. recently increased its capital stock from $10,000 to $30,000. The officers are J. Edward Howland, president; A. H. Perrigo, vice-president and general manager; Dr. Jarvis Barraclough, secretary and treasurer.

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The Capital City Brick Co., Columbus, O., leased from the American Sewer Pipe Co. the plant located in North Columbus for a term of five years at an annual rental of $4,000.

MISCELLANEOUS ITEMS.

J. C. Cyrus, of Lynnville, has bought the Holdsworth Bros. brick plant.

W. Z. Henderson, Benton, Ark., will open up a pottery and brick plant.

Ed. Meyer has bought the tile works at Crescent City, Ill., and will operate it.

Wm. Drayton, Perry Hazleton and others will build a brick plant at Gore, Ohio.

J. H. Moore and J. O. Ragsdale will organize a brick company at Madison, N. C.

The Elk City (Kansas) Brick Company has been incorporated with $5,000 capital stock.

M. C. Stoltz has rented the Ireton (Ia.) Brick Works and will operate it for a term of years.

The Brampton (Ont.) Pressed Brick Co., Ltd., has been incorporated with $50,000 capital stock.

M. H. Lyons of Ft. Reno, Okla., is to add hollow block and sewer pipe machinery to his stiff-mud plant.

J. C. Welch & Co., West Point, Miss., is the name of a new brickmaking firm that is composed of local capital.

Levi Jones has recently bought Mr. Beloat's interest in the tile factory at Browns, Ill., and is now the sole owner.

W. T. Walker has been appointed manager of the Springwells Brick Co., formerly the Hall Brick Co., Detroit, Mich.

The Quitman (Ala.) Brick Mfg. Co. has been organized with $40,000 capital stock by C. C. Edmondson and others.

The Centerville (Ia.) Brick & Construction Co. has installed a 30-h. p. electric motor in place of their old steam plant.

O. W. Dunlap, Bloomington, Ill., has bought the old Rankin Brick Plant and will dismantle it and sell the material.

Chas. L. Leiby, the brick manufacturer of Trindle Spring, Pa., has moved to New Cumberland, where he will make brick.

J. N. Hairgrove of Virden, Ill., has bought the Swift & Gregg brick and tile works at Waverly from Theodore Fisher.

The Calumet Brick Co., Chicago, has been incorporated by Chas. H. Alsip, Chas. B. Obermeyer and James G. Brown.

J. E. Nelson has bought Fred C. Gumpper's interest in the Mansfield (O.) Brick Co. and will continue the business as heretofore.

Mack & Co. have purchased the Pinegrove (Pa.) brick factory and will completely overhaul and operate same on a very much larger scale.

Allen Craighton, Moundsville, W. Va., has leased land at Malvern, Ohio, of I. W. Thompson, and it is reported he will start a brick works.

Peter J. Fowler, of Kingston, N. Y., will have charge of the Stiles & Hart Brick Co. plant at Taunton, Mass., and has moved to that town.

The Bradley Brick Co., Mooresville, Ind., has added considerable new machinery to its plant, so that it can now make a higher grade brick.

The Kansas Vitrified Brick & Tile Co. has been organized in Kansas City, Mo., by W. G. Holt and others. The plant will be at Niotaze, Kansas.

The Hastings (Okla.) Brick & Tile Co. has been incorporated with $10,000 capital stock by John Smith, Will Hearn, William Carden and others.

The W. C. Hill Brick Co., Seattle, Wash., has sold 80 acres of land on the shore of Lake Washington to the Hill Brick Company; consideration, $6,000.

The Judsonia (Ark.) Brick Co. has been organized with $10,000 capital stock by C. M. Erganbright, G. E. Forbes, T. H. Berls, W. E. Forbes, and Nat Young.

The Lynn (Ind.) Tile & Brick Co. has been incorporated with $10,000 capital stock by Daniel Hecker, C. R. Carter, J. A. Byrd, Geo. F. Hill, and C. W. Bowen.

T. C. Lundy and H. S. Mizner, Knoxville, Tenn., have bought the McCroskey Mining & Mfg. Co.'s brick plant at Lonsdale and will add stiff-mud machinery.

The C. F. Smith Stone & Brick Co., Appleton, Wis., has been incorporated with $20,000 capital stock. Incorporators, C. F. Smith, Henry Reuter and S. G. Smith.

The Carter County Fire Brick Co. has been organized by Kentucky and Ohio capitalists; capital stock, $500,000. The plant will be near Saulsbury, Carter Co., Ky.

The Crawfordsville (Ind.) Pressed Brick Co. has secured new capital and will enlarge the plant and build four new kilns at once. F. L. Warner is the manager.

The Harvey (Ia.) Brick & Tile Co. has been incorporated with $21,000 capital stock, with G. W. England as president and T. J. Neiswanger secretary and treasurer.

John Oskison of Vinita, I. T., has bought of S. M. Babcock, Colorado Springs, Colo., the Mount Washington brick yard, southeast of the city. Consideration, $16,000.

The brick manufacturers of the Hudson River Valley recently met in Haverstraw, N. Y., and decided on April 24th as the date for the beginning of the manufacture of brick.

Ira E. Seidle has bought at Lehighton, Pa., the Koch brick works, owned by L. K. Boyer. Dallas Bowman will manage it. An electric motor and other machinery will be added.

The German Rich Stone-Brick Co., 144 E. State St., Trenton, N. J., has been incorporated with $100,000 capital stock by J. A. McAnulty, H. F. New, J. L. Concord, all of Trenton.

The Texas Mining, Milling & Brick Co., Boulder, Colo., has been incorporated with $100,000 by J. A. Ransom, W. G. Houston, F. H. King, W. W. Wampler, T. W. Hill and A. C. Ransom.

The Egg Harbor Brick Mfg. Co., Egg Harbor City, N. J., has been organized with $25,000 capital stock by Louis Granich and Christian Atz, of Egg Harbor City, and Geo. A. Grob, of May's Landing.

The Grant County Tile Co., Millbank, S. Dak., has been incorporated with $100,000 capital stock.

Dudley Hutchins, Wm. Hitchcock, Simon Labold and others of Portsmouth, Ohio, are forming another brick plant.

Frank P. Birrer, of Dillon, Mont., has bought a 20,000 daily capacity brick machine and secured ground for a location.

The Panora (Ia.) Brick & Tile Factory is again in the possession of H. W. Pentecost. Last fall he traded this property to Adel parties.

Collins Bros., of Pittsburg, Pa., have bought four acres of land at Somerset, Pa., and will establish a brickyard as soon as the weather will permit.

Frank Crump and Frank Crump, Jr., of Columbus, Ind. have leased land at Martinsville of Wm. A. Merriman and will put up a large brick and tile plant.

The Oliff-McCormick Brick Co., Ltd., Shreveport, La., has been incorporated with $125,000 capital stock, by W. E. Hamilton, W. B. McCormick and Jos. K. McGrath.

The Dayton (O.) Pressed Brick & Stone Co., organized by John Heaton and others, has leased 232 acres of clay land near New Jasper and will construct a modern pressed brick plant to make 20,000 brick daily.

The Davenport (Ia.) Brick & Tile Co. has been incorporated with $50,000 capital stock. The officers are: August E. Steffen, president; Herman G. Pape, vice-president, and Fred Reddewig, secretary and treasurer. The plant is at Buffalo, Ia.

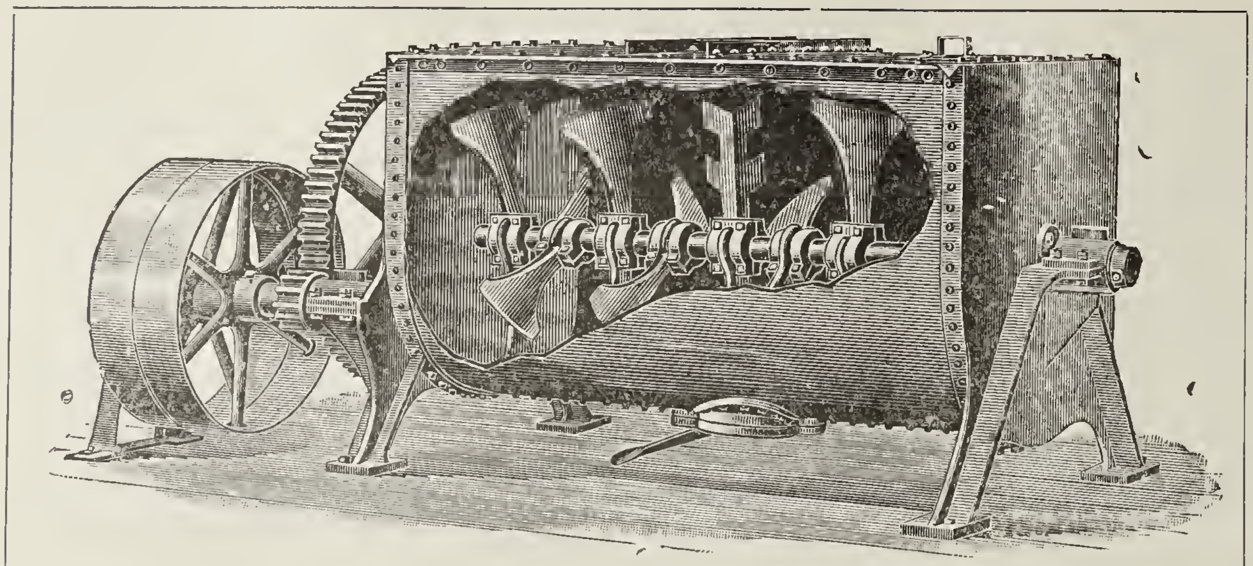
Egg Harbor, New Jersey, is to have a new building brick plant, for which Chambers Brothers Company of Philadelphia has received the contract for machinery. Buildings are now being erected and it is expected to have the plant in operation within thirty days.

The Pennsylvania Brick & Stone Co., Chester, Pa., whose plant is at Bridgewater, began operations at their quarry. A complete outfit of brickmaking machinery has been installed, including three modern brick machines. All of the machinery is operated by electricity.

The LeRoy (Kansas) Vitrified Brick Co. has been incorporated and will build a 100,000 brick daily capacity plant. A. R. Battley of Pittsburg, Kan., is the promoter. G. J. Ferguson and R. J. Boyd of Kansas City, and J. R. Ahlefeld and W. A. Dickey, of LeRoy, are also interested.

Mr. Lincoln S. Morrison, Southern representative for Chambers Brothers Company, has just turned in a contract for a machine outfit for the Leali Pressed & Fire Brick Co., at Kingsland, Arkansas. Mr. John Morrison formerly of Austin, Texas, will have the general management of these works.

The Renton (Wash.) Clay Works has changed hands, and the capital will be increased to $300,000 and the plant enlarged and sewer pipe made. The home office is at Seattle. J. R. Miller, president of the old company, will retain his position. Associated with him are Moritz Thomson and E. J. Mathews of Seattle, Peter Larson of Montana and J. E. Banberger of Utah.



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Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

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White Glass Sand or Sand Brick Property, near St. Louis, Mo.. Situated on two roads. All facilities. Switches on property. Address

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Brick and tile plant. Stiff Mud. Continuous kilns. Steam dryer. Good clay and excellent market.

D. W. TOWNSEND,
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FOR SALE.

One J. D. Fate A Special Auger Machine, 40,000 brick per day. In first class working order.

REDFIELD BRICK & TILE WORKS,
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FOR SALE.

20,000 fine pallets. $30.00 per thousand, F. O. B. cars here.

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NEW AND SECOND-HAND MACHINERY FOF SALE.

One No. 6 Machine, capacity 50 to 75 thousand brick per day.
Three "Eli Jr" Brick and Tile Machines.
One "Little Eli" Brick and Tile Machine.
One No. 1-A Brick and Tile Machine, with square hopper.
One No. 1 Brick and Tile Machine, with upright pug mill. second-hand.
Two No. 2-B Brick and Tile Machines, with square hopper.
Two No. 5 Disintegrators, capacity 40 to 60 thousand per day.
Two No. 1 Disintegrators, capacity 25 to 35 thousand per day.
Three Winding Drums or Hoists.
One "D" Freese Tile Machine, second-hand.
One 30 h. p. Engine.

Above machinery is same as new and will be sold cheap. It is guaranteed to be as represented in circulars mailed on request.

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FOR SALE.

50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets Track gauge 25 inches.
Both styles of cars in first-class repair.

ATLAS CAR & MFG. CO.
Cleveland, Ohio

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine. Address

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FOR SALE.

1 Raymond Victor double die steam repress.
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All in thorough repair.

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One E. M. Freese & Co. stiff mud Union Brick Machine, with pug mill combined. Special size.
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Two Stevenson nine-foot iron dry pans.

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HERE IS THE REMEDY.

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Carbonate K.B. C.F.H. of Barytes

The only preventative for scum and discoloration on facing Brick and Terra Cotta; neutralizing the Sulphate of Lime in the Clay and Water.

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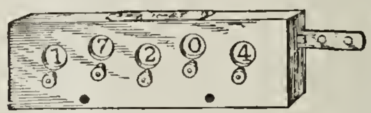

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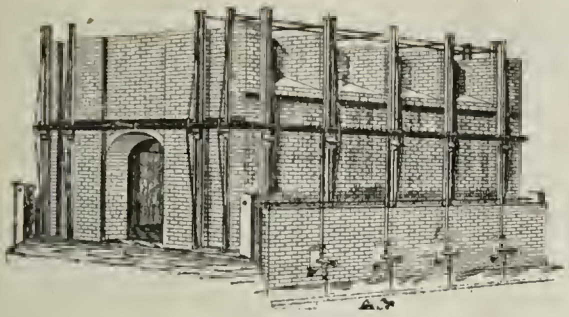

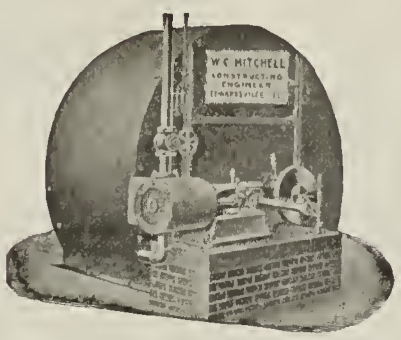

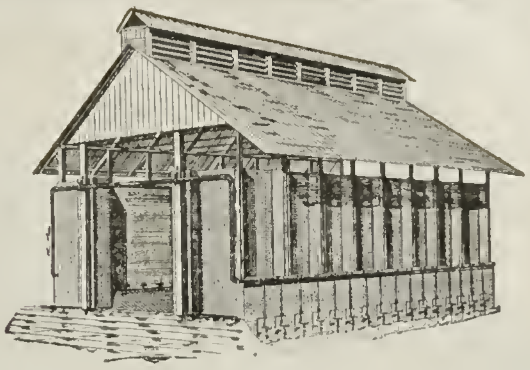

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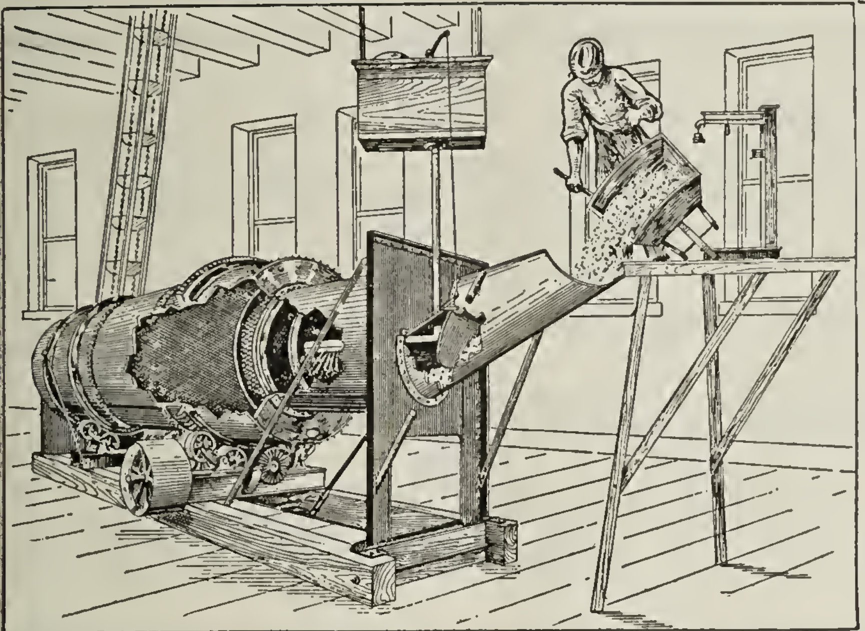
Consulting Engineer of Clay Plants, EDWARDSVILLE, ILL.



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AUTOMATIC FROM BEGINNING TO END.

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The process is continuous.

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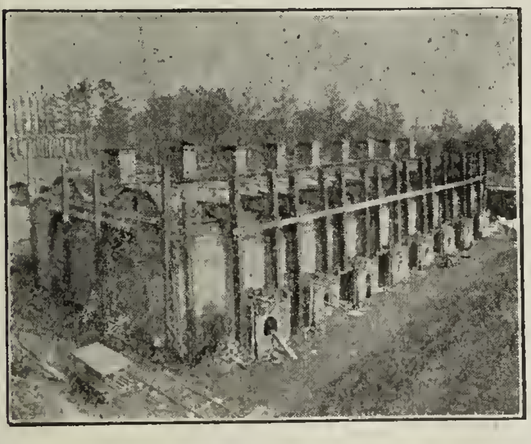

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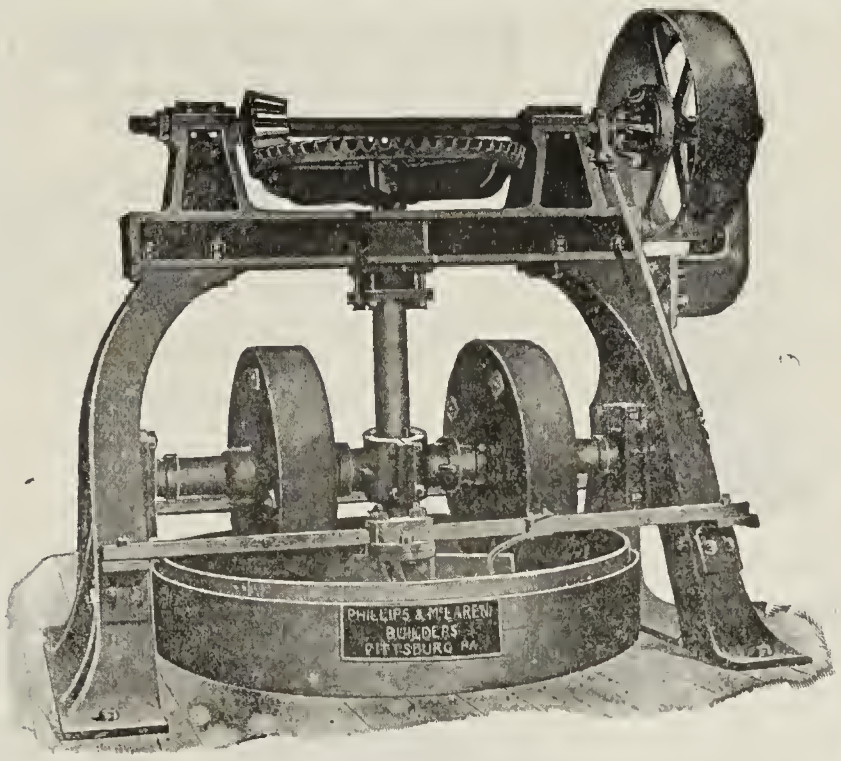

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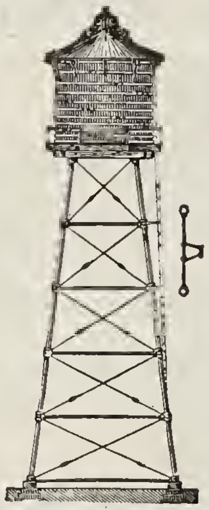

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DIRECTIONS FOR CHARGING

FIRE! FIRE!! FIRE!!!

THE "CHILDS" FIRE EXTINGUISHERS APPROVED

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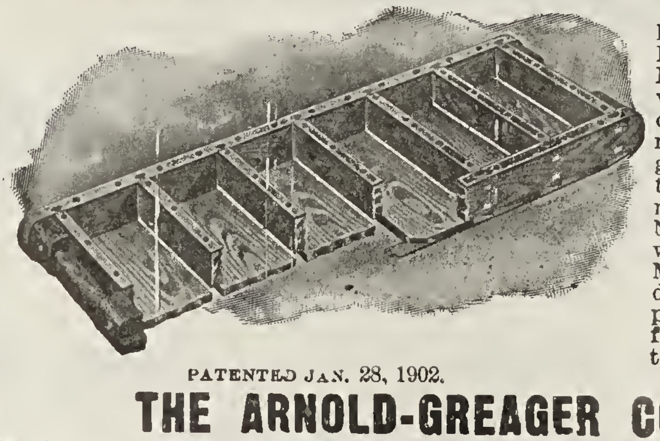

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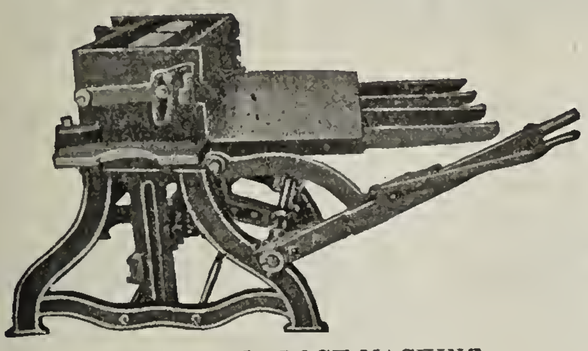

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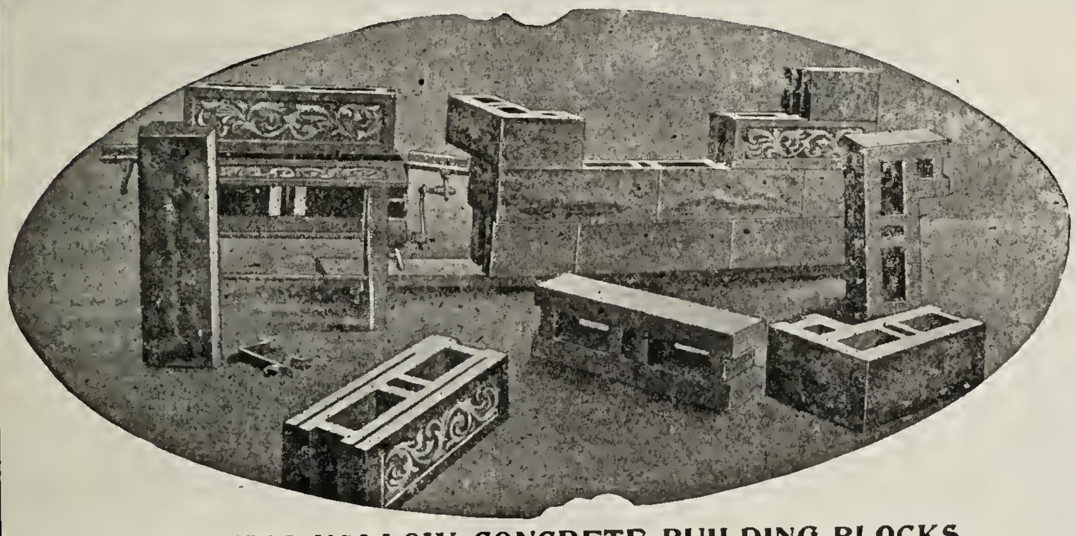

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Parlor Cars. Sleepers. Dining Cars.

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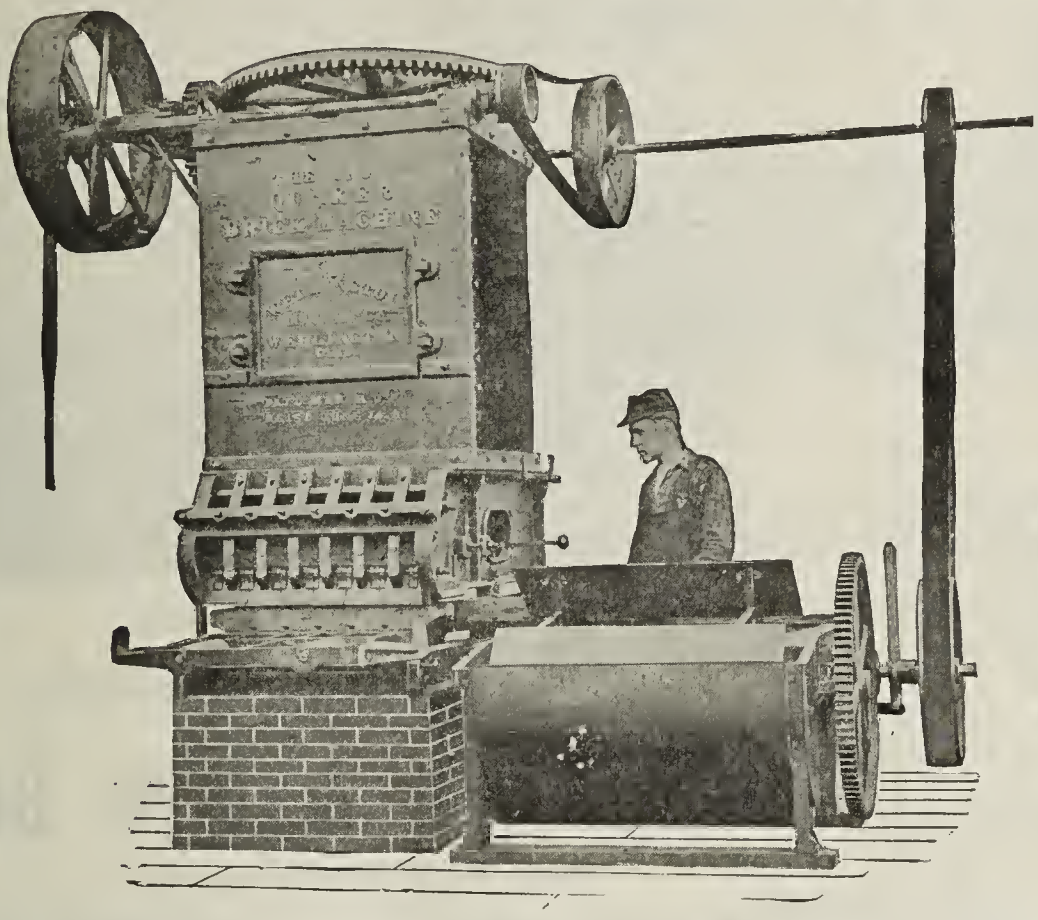

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ALL OTHER SUPPLIES.

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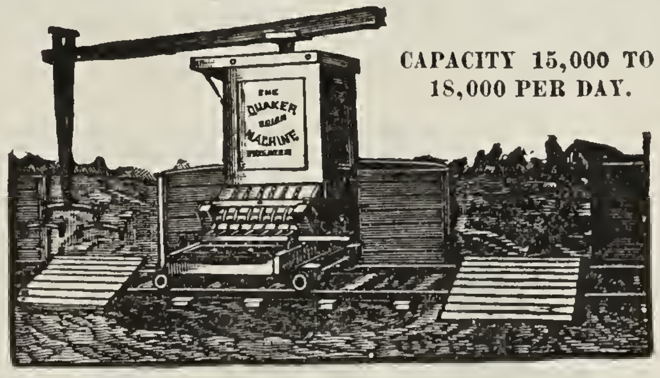

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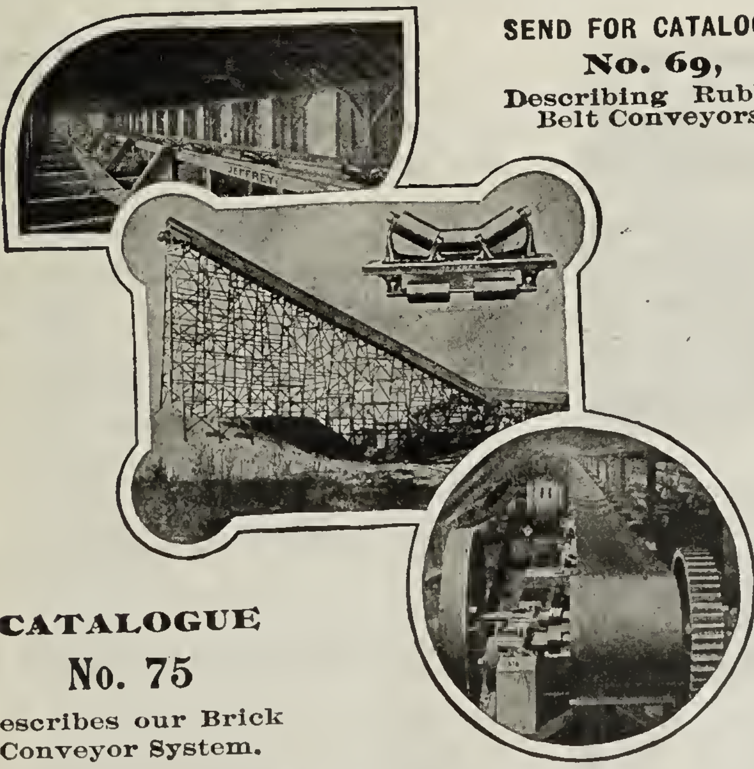

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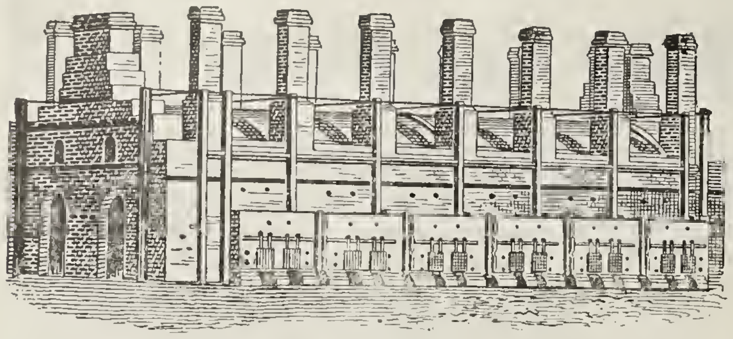

Improved Kilns, Square, Round and Continuous, End or Side Fire, Hot Air and Steam Tunnel Dryers, Steam or Hot Air Dry Floors, Test Kilns any Size.

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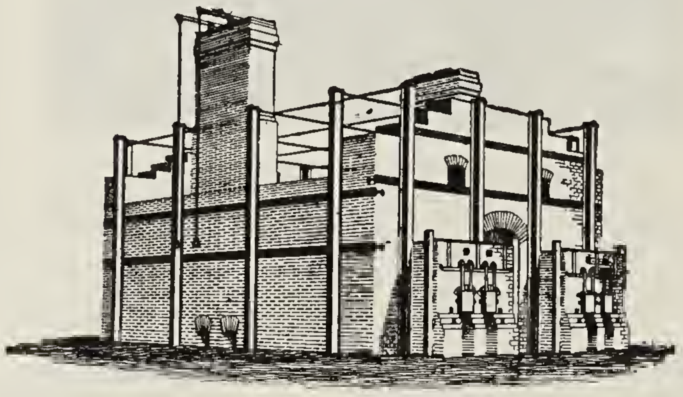
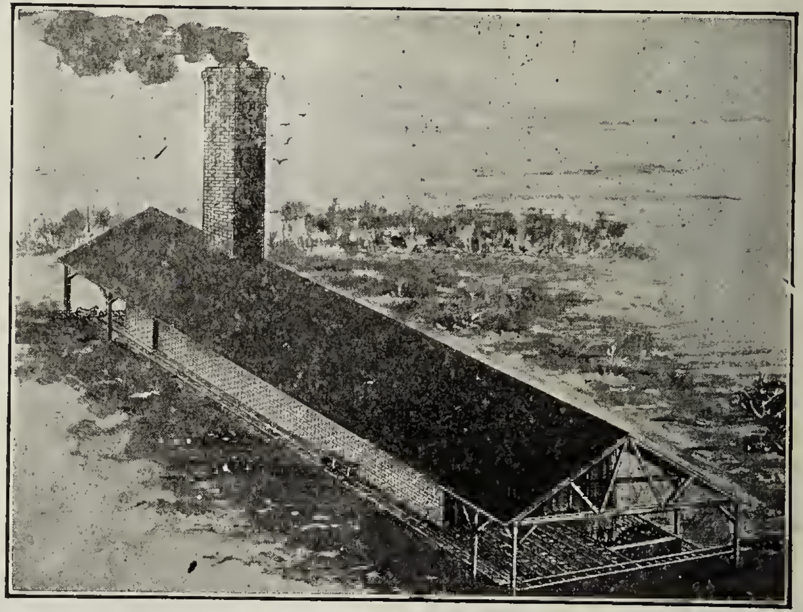


Build the best; it is the cheapest in the end.

Hot Air or Waste Heat Dryer.



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Have you any Sand?

If so, you need what we have.

Our System is used by the first Sand-Lime Brick Plant in the United States, and has been in continuous operation and has produced and sold more brick than any other single plant.

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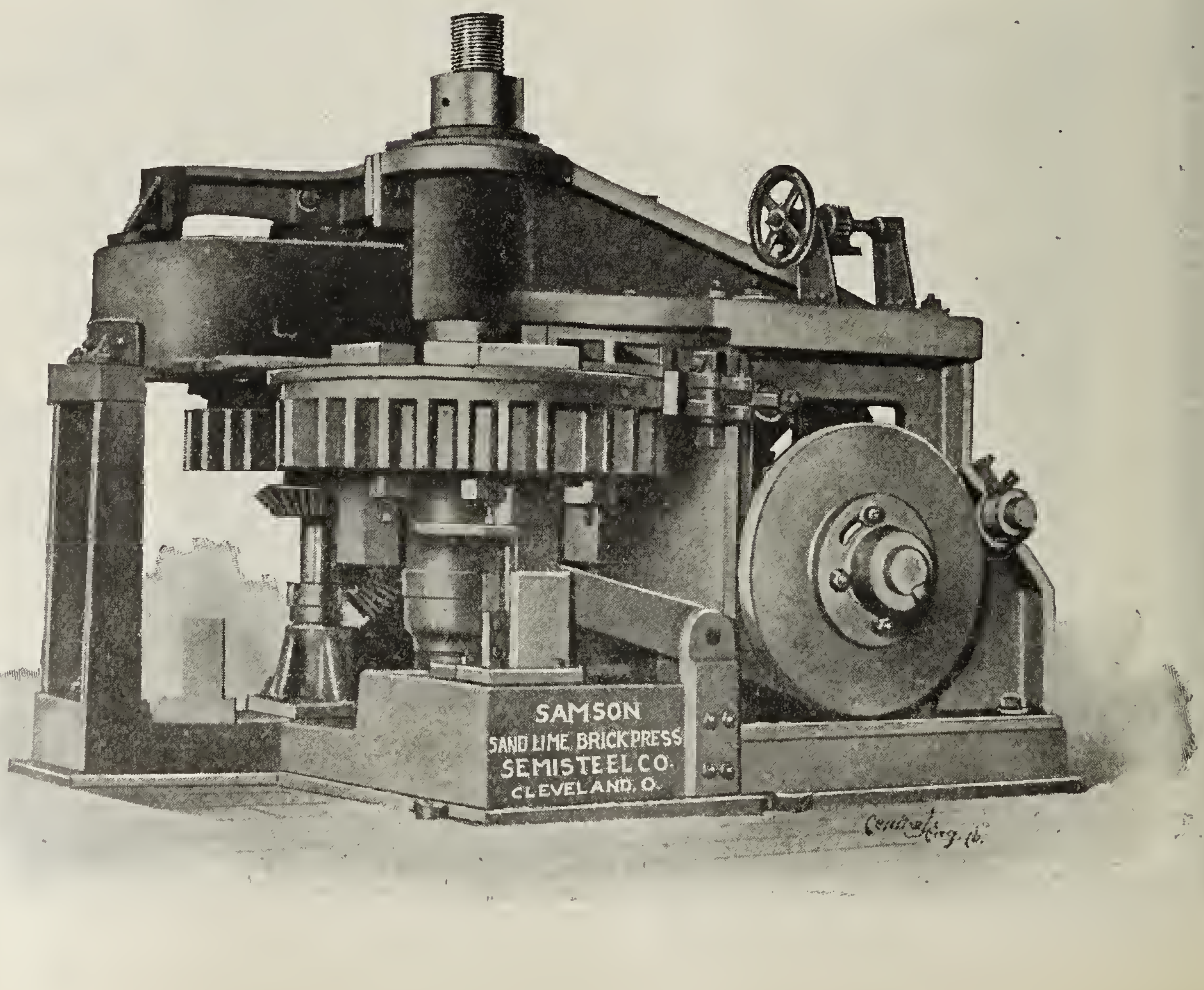

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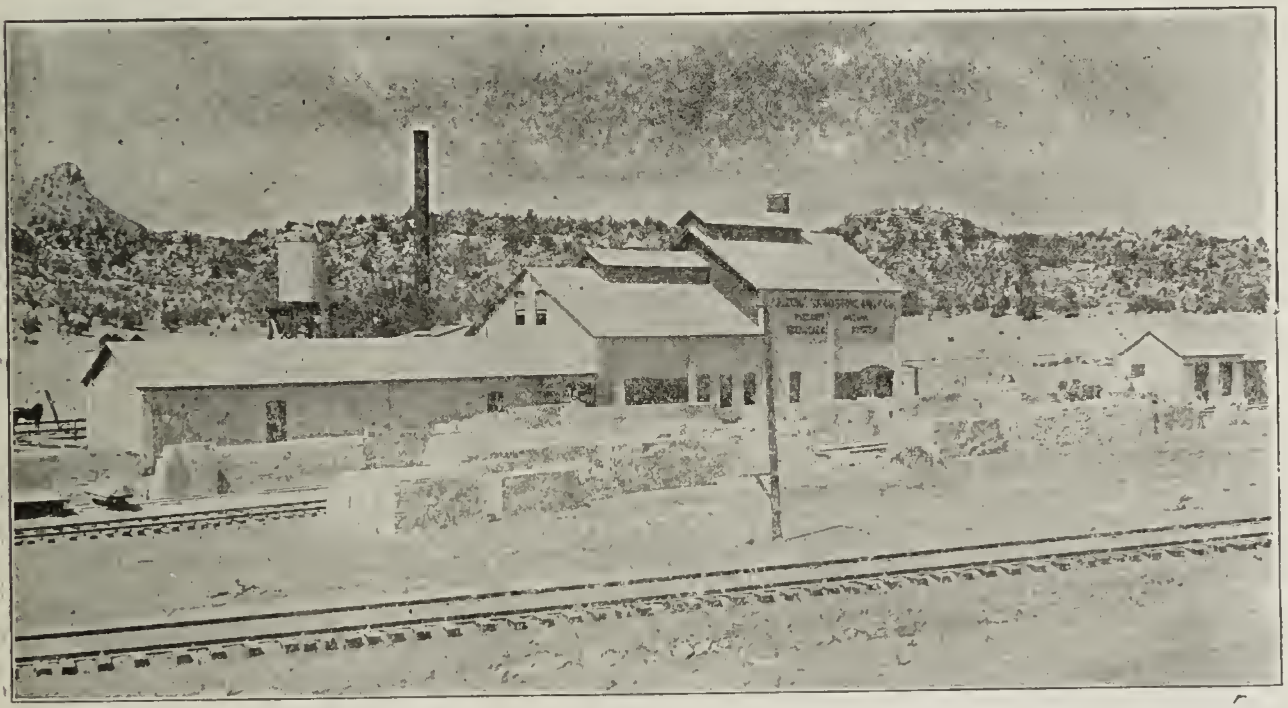
SAND-LIME BRICKS AND BLOCKS

25 Factories Designed, Equipped and Set in Operation During the Past Year in the United States and Canada.

OUR RECORD: Combined capacity of factories in 1903, 15 million bricks per annum.
Combined capacity of factories in 1904, 150 million bricks per annum.

Received from the Jury of Awards at the Louisiana Purchase Exposition the highest award for excellence of sand-lime brick.

U. S. Company's Quarters Whipple Barracks, Prescott, Arizona, Erected Out of "Huennekes System" Sand-Lime Bricks



Factory of the Arizona Sand-Stone Brick Company, "Huennekes System" Prescott, Arizona. Finished in Bricks of Their Own Manufacture.

"THINK THIS OVER."

Before the expiration of this year the total combined capacity of the factories erected and operated under the "Huennekes System" will be about 300 million bricks per annum—or a growth of about 2,000 per cent in one year.

Remember the doubts and scoffings about the "dry pressed brick" but a few years ago and the money made by the pioneers in this business.

The Sand-Lime Brick Business is to day in the identical state as the dry pressed brick business was but a few years ago.

All of our special machinery is manufactured in the United States by the foremost machine shops in their particular line of business, and are thoroughly tested, insured and guaranteed before leaving shops. All special machinery, as well as our methods and process are fully protected and covered by United States Patents. **Without the use of the same it has proved impossible to produce a high grade brick out of sand and lime in a commercial way at a low cost. The rapid growth of our business from 15 million brick per annum in 1903 to 150 million brick per annum in 1904** is not only a proof of the merits of the "Huennekes System." but also of the product itself.

Send for free booklet, tests and testimonials.

The original, oldest and only experienced Engineering Firm in the Sand-Lime Brick Industry.

H. HUENNEKES COMPANY

Engineers and Contractors for the
Erection of Sand-Lime Brick Factories.

MAIN OFFICES
114-118 Liberty St., NEW YORK, N.Y.

Western Office: 660 Monadnock Building, CHICAGO, ILL.

1856 **STEAM PRESSES** 1904

FOR

Vitrified Sewer Pipe, Fire Proofing

OR

DRAIN TILE

We also manufacture **MACHINERY** for different clay working and manipulation.

Dry and Wet Pans, Clay Mills, Combination Mills, Elevators, Screens, Trucks and Wagons. PRESSES for Nozzles, Sleeves and Runner Brick for Bessemer Steel Process, Tuyere Presses, etc. DIES for Wall Coping, Flues, Roofing, Traps, etc.

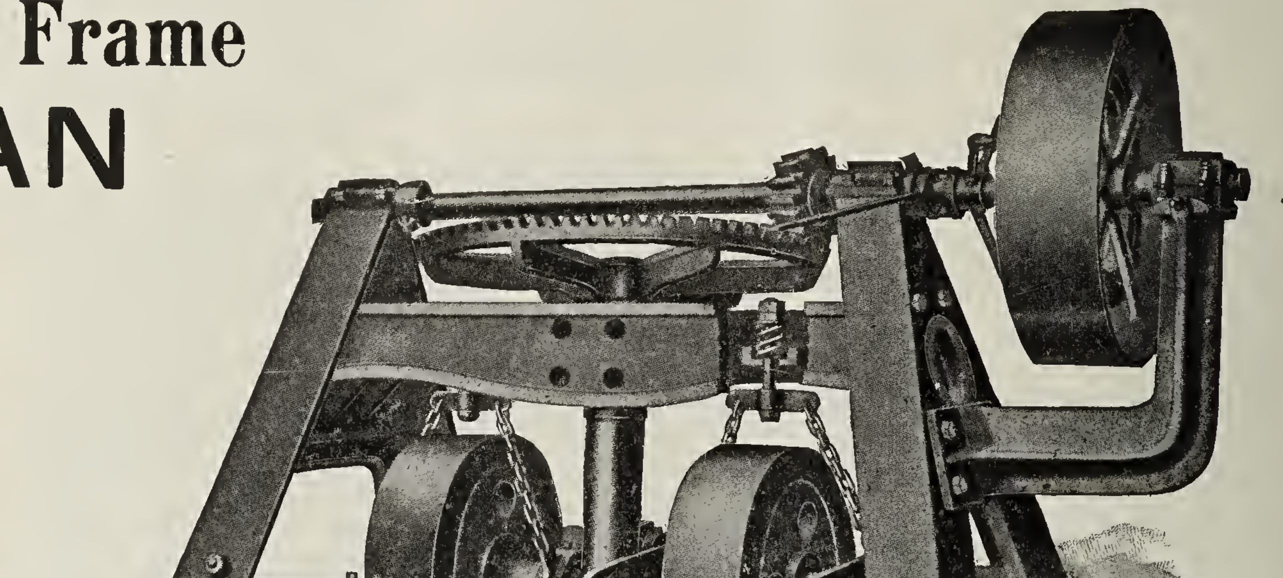
Write for Prices and Terms, stating capacities wanted.

THE TURNER, VAUGHN & TAYLOR CO.
CUYAHOGA FALLS, OHIO, U. S. A.

Nine Foot Iron Frame
DRY PAN

With Independent and Suspended

MULLERS



A well-tried and proven Success.

EAGLE IRON WORKS, BUILDERS, DES MOINES, IOWA

ORDERS FOR PERFECT CLAY SCREEN

are proving our claims, as our record of sales for one week are fifteen screens. Thirteen of these were for old customers while two were for new ones. If our old customers were so well pleased, why can we not do as much for you?

If you use a screen we claim we can save you money by using ours.

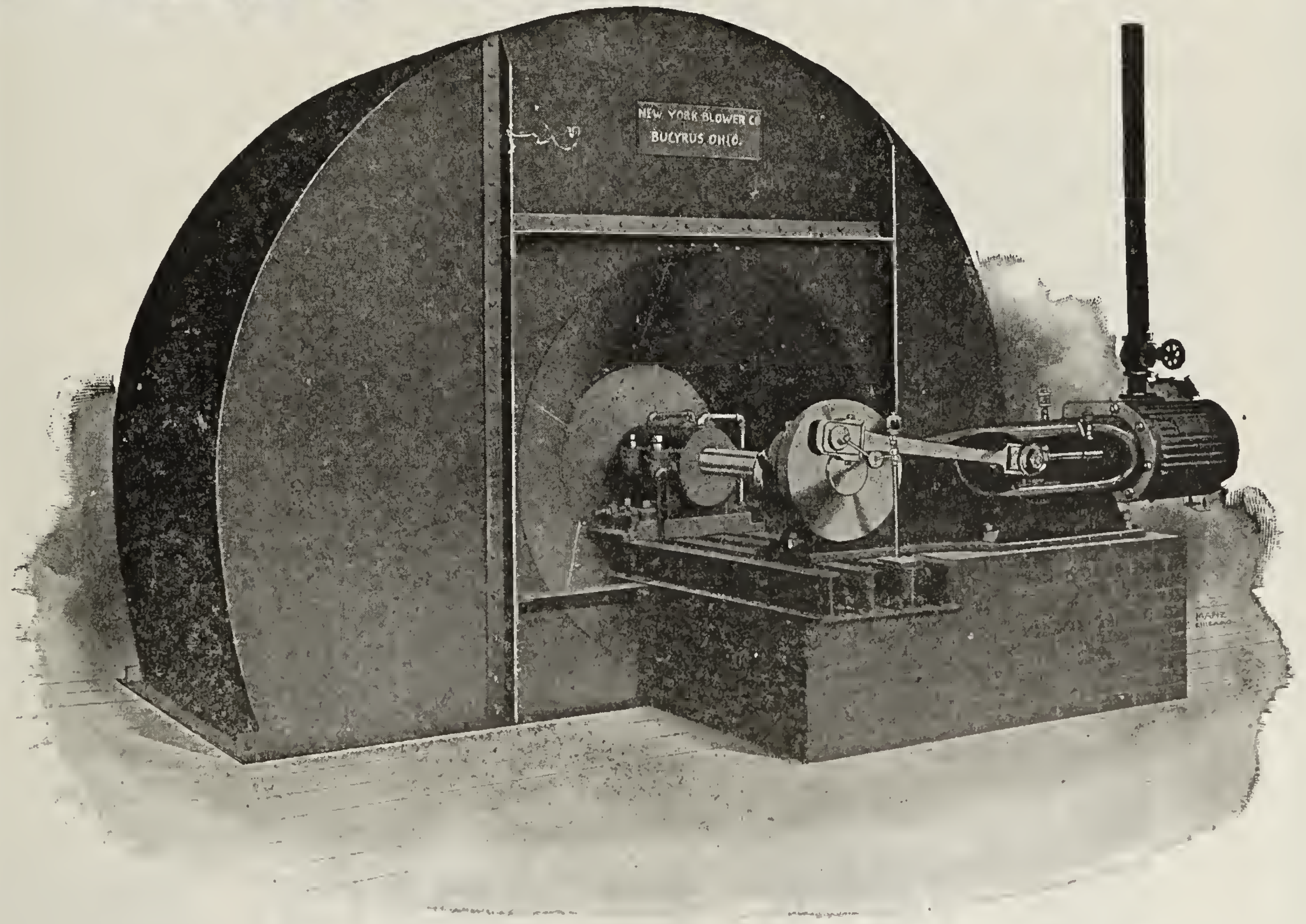
DOES NOT THIS RECORD OF SALES PROVE OUR CLAIM.

We guarantee satisfaction, let us show you what we can do. Our new catalog for the asking.

DUNLAP MFG. CO.,
BLOOMINGTON, ILL.

WASTE HEAT CLAY DRYER.

We offer the New York Blower Company's Improved Waste Heat Dryer as the most successful means of utilizing the heat from the cooling kilns which is at present an absolute waste. The two important factors in drying are heat and circulation of air; one being as important as the other. These are both amply provided for in our dryer. By the use of mixing chamber, provided with the proper dampers fresh air can be admitted to the fan to reduce the temperature of the incoming gases to the proper degree. By changing the speed of the fan the amount of air blown into the tunnels is easily regulated. With this apparatus, by which you can readily regulate and control the heat and circulation, you have a dryer which will work successfully in all climates and temperatures The necessity of perfect circulation in a dryer should never be overlooked. With this end in view we provide additional circulating devices in our largest dryers. This maintains an even and positive circulation throughout the dryer and insures the successful drying of your brick.



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25th Place and Stewart Avenue.

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Cathedral Corner, Fennel Street,
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NEW YORK BLOWER CO.
BUCYRUS, OHIO.

A WILFUL waste of WASTE HEAT is a WOEFUL want of BUSINESS FORESIGHT.

In fact, a waste of any kind on a brick plant is a slice off the dividends. This needs no demonstration, nor will it take long to convince you that the **RODGERS DRYER** will stop all dryer leakage and will enlarge the capacity of your plant materially.

WE TEACH YOU HOW TO DRY YOUR BRICK ECONOMICALLY.

Waste no Heat, Waste no Time, Waste no Brick

WRITE TO-DAY TO

L. E. RODGERS ENGINEERING CO.

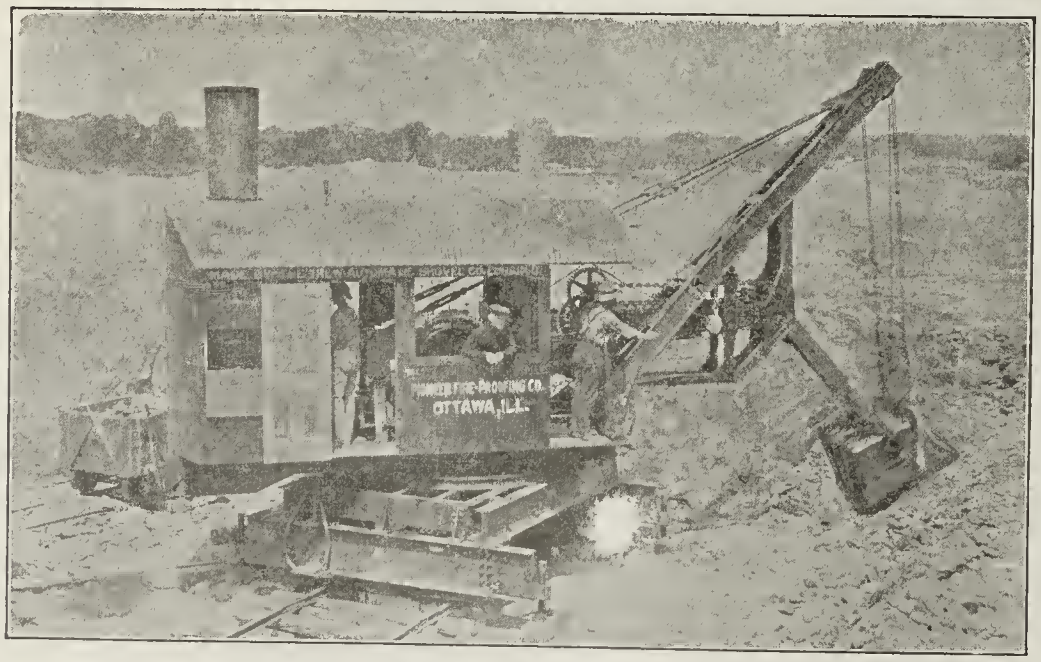
WASTE HEAT DRYER SPECIALISTS

303 Dearborn Street, *CHICAGO*

HANDLE YOUR CLAY WITH ONE MAN AND

The Thew Steam Shovels

Made In Four Sizes. Mounted on Car Wheels or Traction Wheels.



Type No. 2 Shovel—Pioneer Fireproofing Co., Ottawa, Ill.

Especially adapted for brickyard requirements. The shovel operates in a complete circle, enabling material to be delivered at side or in rear at will. The Dipper is hung from a horizontally moving carriage and can be adjusted to cut to any desired level.

: : Only One Operator Required.
Wire Cables used instead of Chains.
Strictly First-Class in Every Detail.

Economical for brickyards 30,000 to 40,000 daily capacity.

Operated by one man for outputs up to 125,000 brick per day.

Write us for Catalogues and Information.

THE THEW AUTOMATIC SHOVEL CO.,

LORAIN, OHIO.

A Perfect Clay Handling System.

We install our system and turn it over to you under guarantee of satisfactory results.

We do not shut your plant down while installing.

Our entire system is operated and controlled by ONE man at the hoist, and no horses, locomotives, or men required between bank and machine

Scarcely any power required.

We invite you to come and see a large plant in operation.

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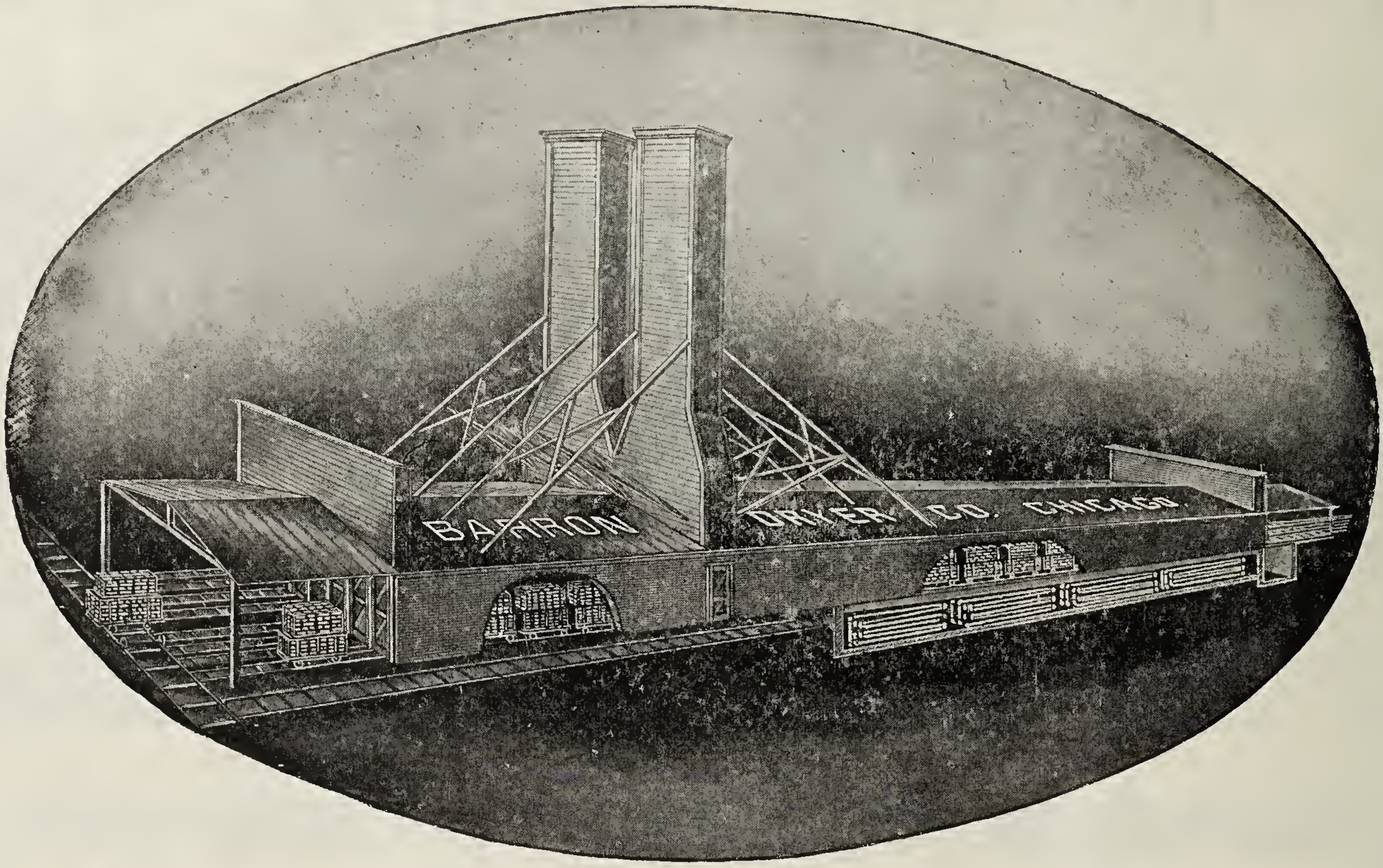


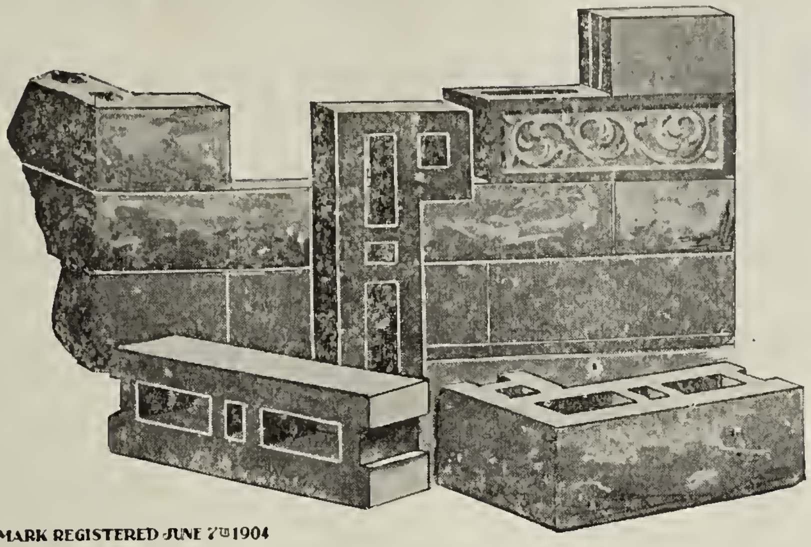
If You Are Progressive

You know that the brickmakers who are making the money in these days are those who have installed an up-to-date drying system enabling them to cope with ease with the heaviest demands of the market, their operations being uninterrupted all the year round.

This is true of them, what of your case? Why adhere still to antiquated methods subjected to weather limitations. Determine to install the most effective drying system in existence and apply for information and quotations to the

BARRON DRYER COMPANY

Temple Court Building, 225 Dearborn Street, CHICAGO, ILL.



TRADE MARK REGISTERED JUNE 7th 1904
BY HARMON S. PALMER HOLLOW CONCRETE
BUILDING BLOCK COMPANY.

PALMER'S MACHINE

IT IS THE BEST BY EVERY TEST

ALL OF THESE POINTS ARE COVERED BY PATENTS TO US AND NO OTHERS. FOUR PARTIES HAVE ALREADY BEEN ENJOINED BY US IN UNITED STATES COURTS FOR INFRINGING OUR PATENTS.

BECAUSE:

It makes all lengths from **four** to **thirty-two** inches.

It makes all widths from **four** to **eighteen** inches.

It makes all heights from **one** to **nine** inches.

It makes all angles for **bay-windows.**

It makes blocks of different contour by removable face plates with patented designs.

It makes **joist** blocks and **nelting-courses.**

It was invented by a **practical** builder who knew what was necessary.

Its proportion as to strength and weight are correct.

It is not a cumbersome and bungling piece of mechanism.

Every block necessary to complete system of construction made by Palmer's machine. No waste.

Don't be deceived into buying a machine just because it makes a hole in a block. This is like poison to our business.

Beware of charlatans and mountebanks who know nothing of the business, but want the public's money on the reputation and success of others.

Report infringing machines to Mr. Frank L. Wolfe, Two Rivers, Wis., Secretary National Organization of Cement Block Makers.

THE HARMON S. PALMER COMPANY

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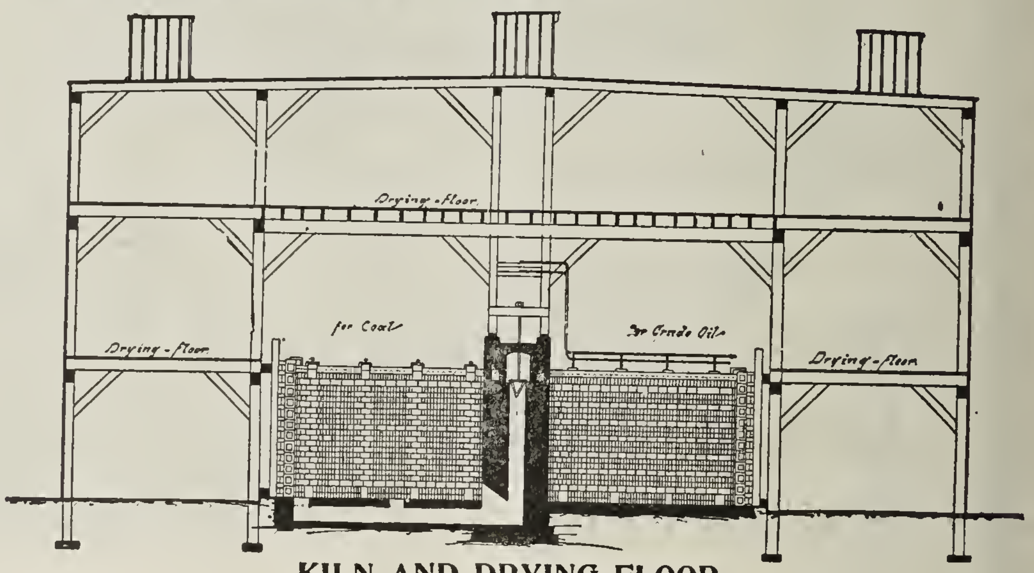
Lehmann Portable Continuous Kiln in Combination with Drying Floors...

CHEAPEST AND SIMPLEST CONTINUOUS KILN ON THE MARKET

Can be constructed ready for work in six to eight weeks, and adapted to all kinds of fuel. Saves 65 to 75 per cent. on fuel as compared with up-draft or down-draft kilns. Drying is done by heat escaping from kiln without extra expense, gradually, uniformly and thoroughly. Goods are handled by automatic delivery elevators, and cost of handling, drying and burning is reduced to a minimum.



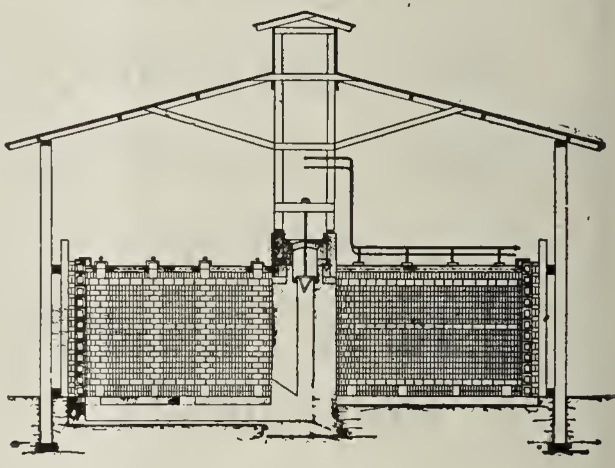
KILN AND DRYING FLOOR.

Lehmann Crude Oil Burning Apparatus

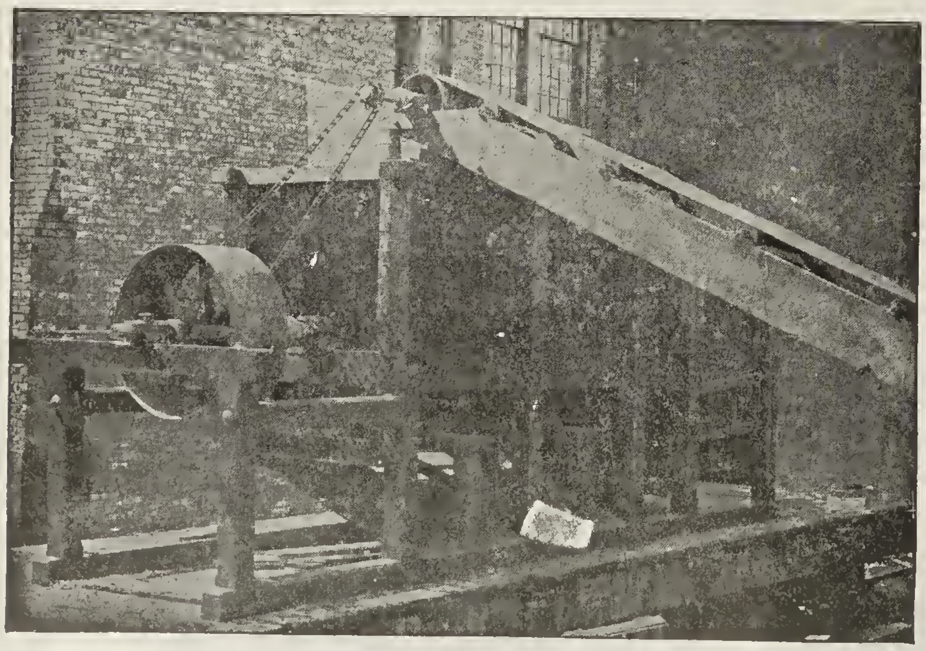
First successful attempt to burn Crude Oil in a Continuous Kiln; can be applied to any system.

Lehmann Metal Lined, Self-Lubricating Die

Can be made and adapted to any kind of clay at the place of manufacture, and insures uniformity of size of manufactured goods.



CONTINUOUS KILN



LEHMANN SLUMMING MACHINE

Lehmann Slumming Machine

MOST PRACTICAL, SIMPLE AND EFFECTIVE

The slumming process is the most economical and the only reliable method for removing gravel and other foreign matter from Common Clay, Kaolin, Chalk, Mineral Paints, etc.

ALL THESE DEVICES HAVE BEEN TRIED THOROUGHLY AND SUCCESSFULLY.

Will plan and construct any system of Kiln, Up-Draft, Down-Draft, Muffle or Tunnel. Plans and estimates furnished for Brick and Tile, Lime and Cement Work. Practical tests made.

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163 Rhine Street, Chicago, Ill.

SOMETHING DOING

¶ When a man finally gets a thorough understanding of the benefits that come to users of the Martin Machinery — the time saved, the labor saved, the money saved—it doesn't take him long to place his order with the Lancaster people.

¶ The man who pays the bills and then has something substantial to show for his investment, is the man who has his plant equipped with . . . . .

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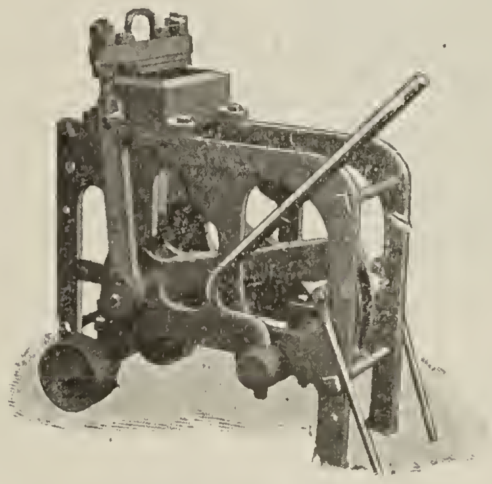
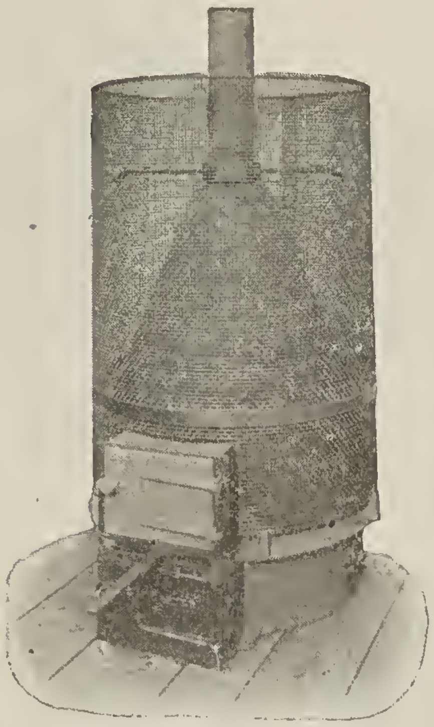
Machinery

THE BEST BY TEST

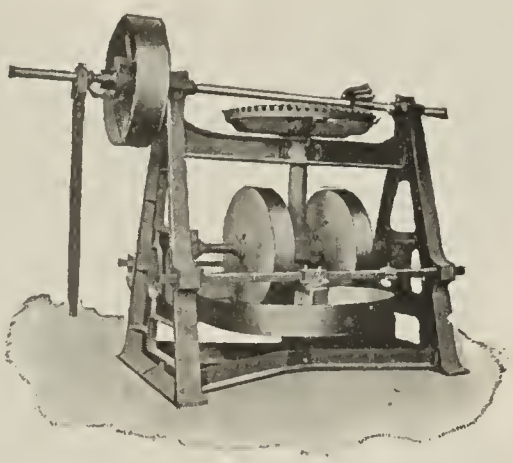


REPRESSES.



SAND DRYERS.

TRUCKS.



DRY AND WET PANS.

DON'T FORGET

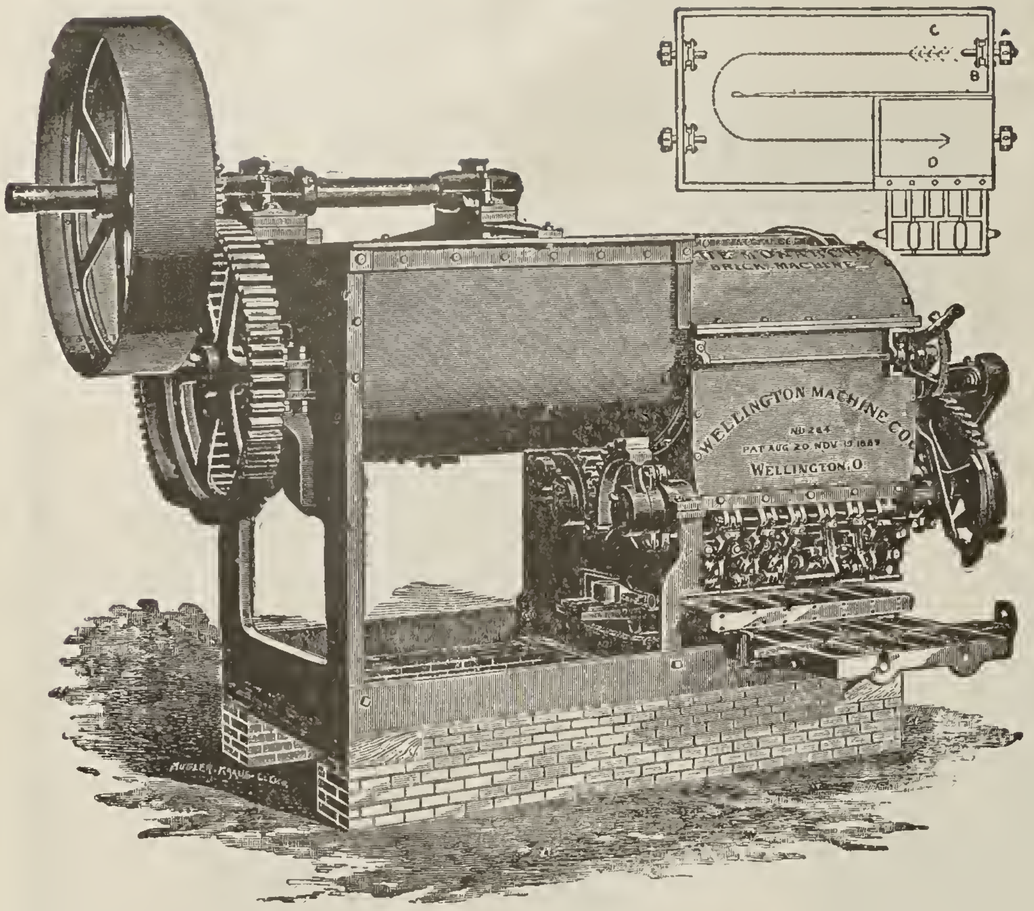
That we are prepared to equip brick plants complete, including the brick machinery, dryers, engines, boilers; in fact, everything required to make good brick all ready for market.

We guarantee our machinery too.

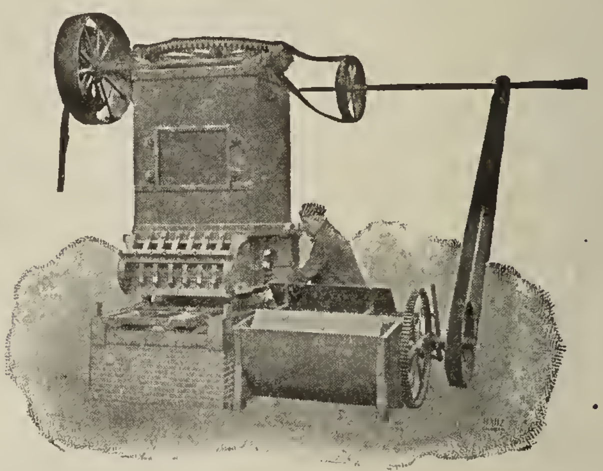
Let us send you our new catalogue No. 90, describing "Everything a Brickmaker Needs."

The HENRY MARTIN
BRICK MACHINE
MFG. CO. Inc.
Lancaster, Penna.

BRICK and TILE MACHINERY



MONARCH STOCK BRICK MACHINE
Capacity, from 30,000 to 50,000



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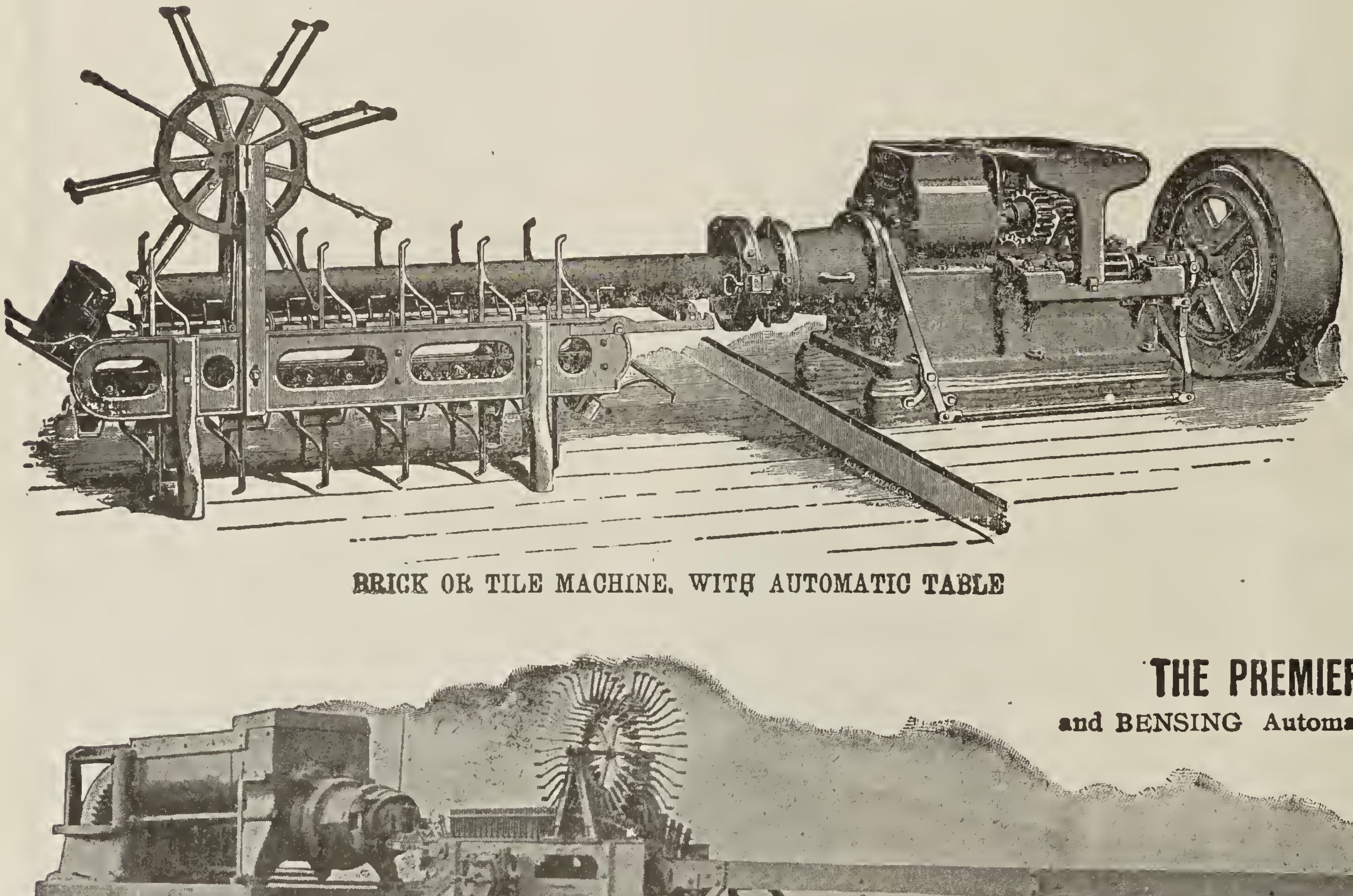
Horse or Steam Power. Capacity, 20,00 to 35,000

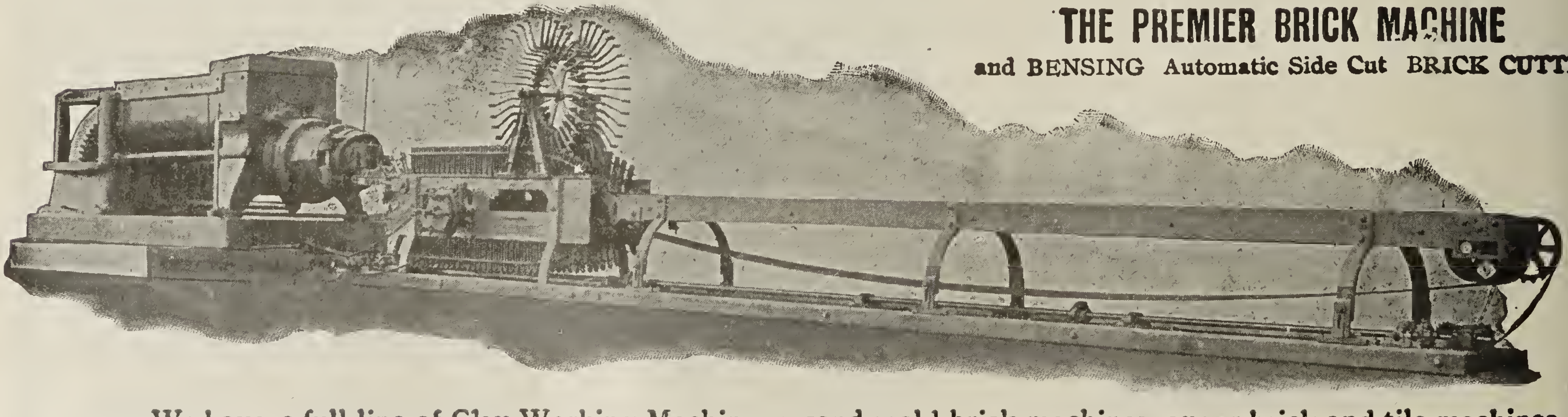


BRICK OR TILE MACHINE, WITH AUTOMATIC TABLE

"We Fulfill our Guarantees."

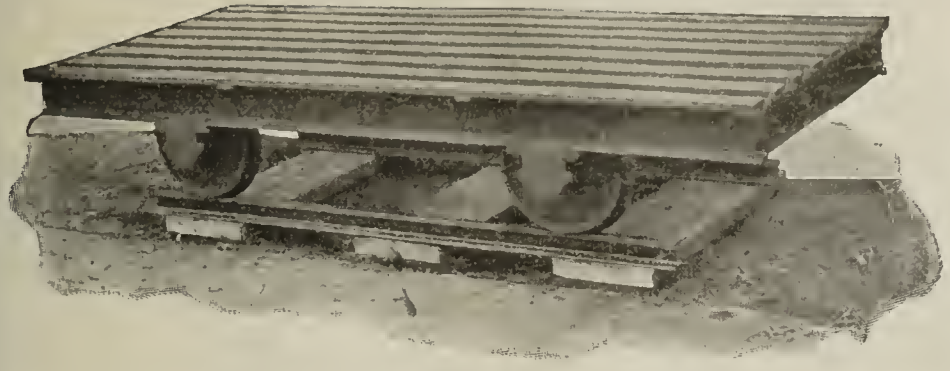
THE PREMIER BRICK MACHINE

and BENSING Automatic Side Cut BRICK CUTTER



We have a full line of Clay-Working Machinery, sand mold brick machines, auger brick and tile machines, Automatic side and end cut tables, dies, molds, barrows, trucks, sanders, represses, pug mills. *The only down cut, reel side brick cutter on the market for cutting face brick that do not require repressing.* We can guarantee to make you a better face brick with this cutter than you can get from any other cutter on the market.

B. E. LaDOW, 701 Dwight Building, KANSAS CITY, MO.



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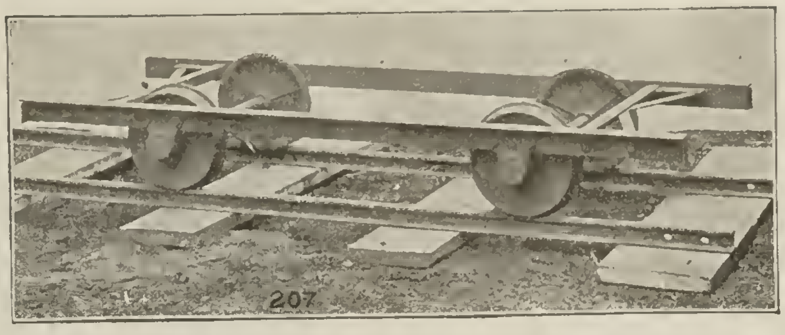
STEEL DECK CAR, CHANNEL FRAME.
For Drying Brick, Sewer Pipe, Etc.



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FLAT CAR, WOODEN DECK.
For Brick, Tile, Etc.

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Designers and Builders of

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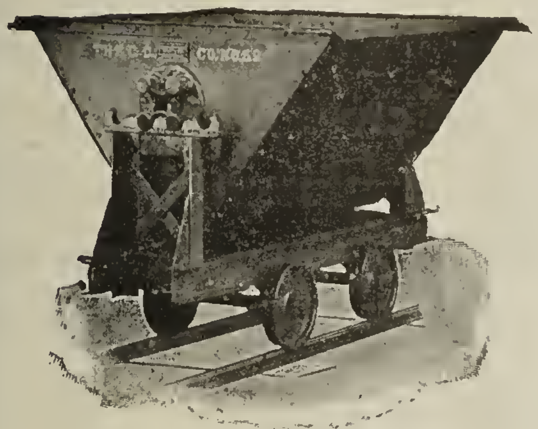
Dryer Cars of Every Description, Dump Cars, Turn Tables, Transfer Cars, Switches, Frogs, Rails, Etc.

Overhead Trolleys, Kiln Doors, Furnace Fronts, Grate Bars and Brick Barrows : : : :



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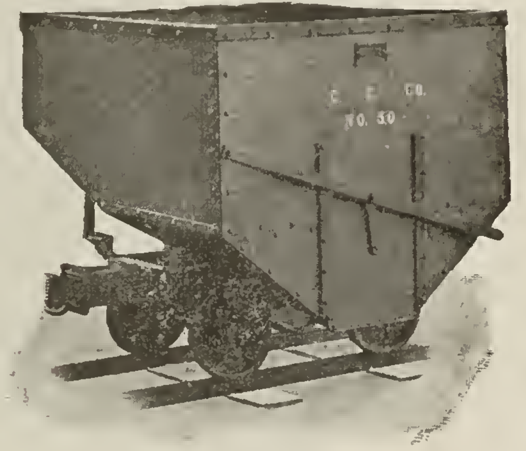
For Handling Coal, Sand, Ashes, Etc.



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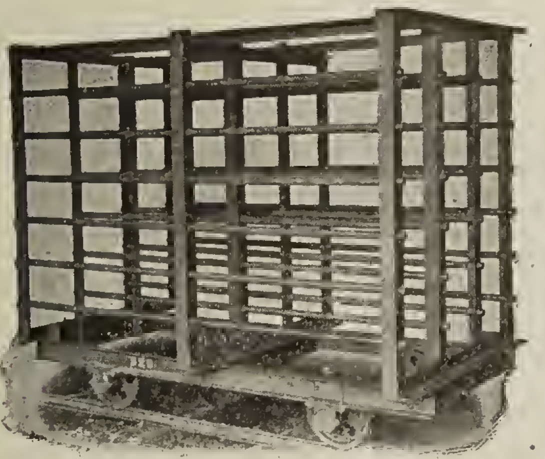
For Dumping Into Dry Pans, Disintegrators and Crushers.



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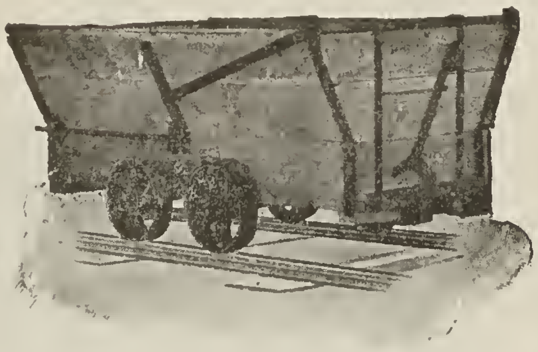

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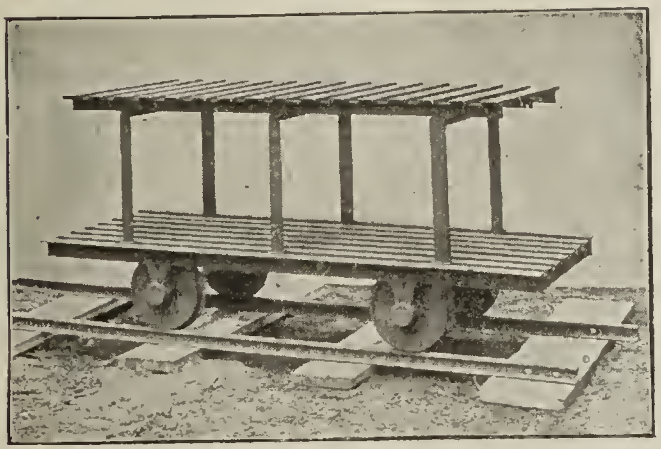
END DUMP CAR.
Adapted to Handling Coal, Shale, Sand, Etc.



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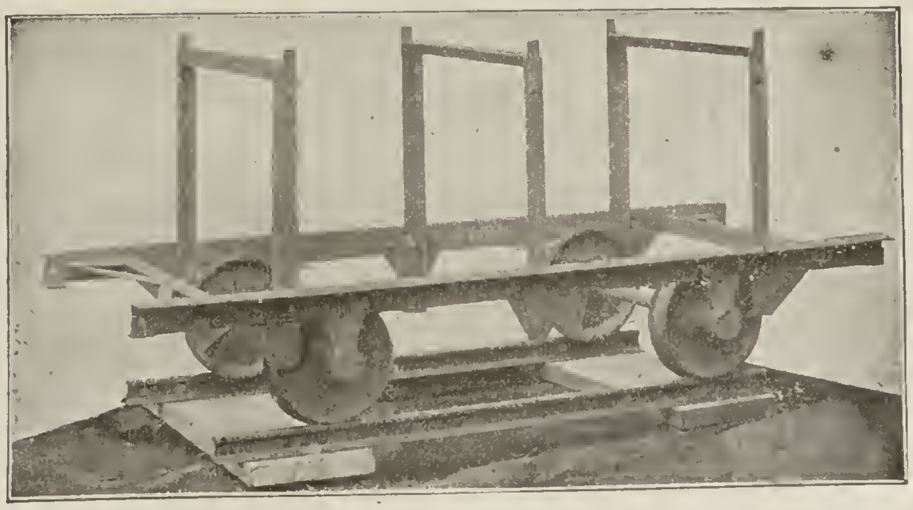
DOUBLE DECK CAR, STEEL DECKS.
For Brick, Tile, Fire-Proofing, Etc.



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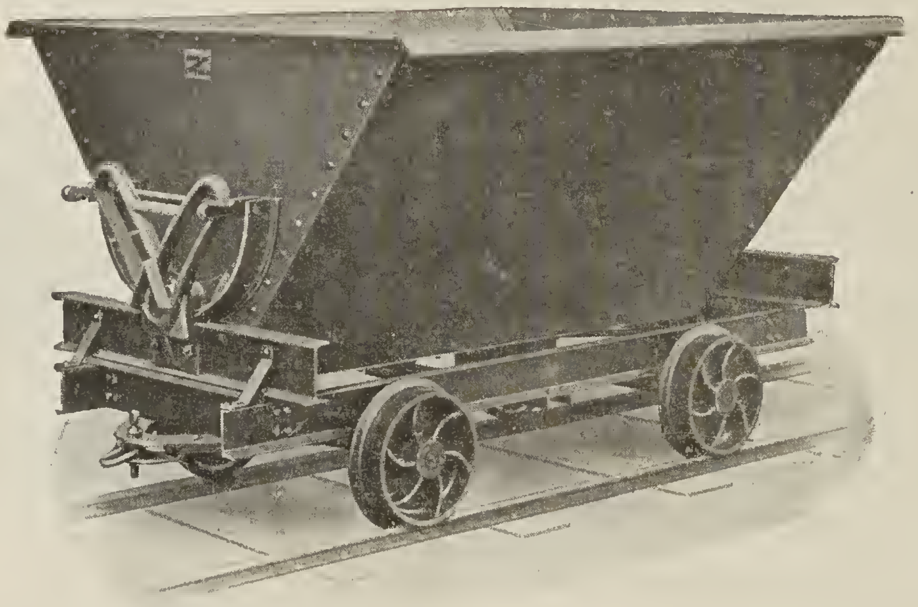
DOUBLE DECK CAR, WOODEN DECK.
For Brick and Other Clay Products.

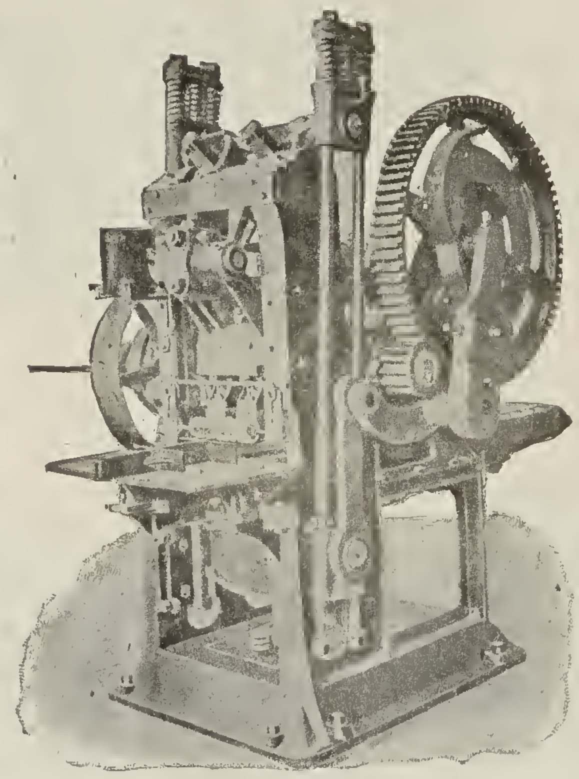
Are Your Clay Cars Satisfactory?-



Clay Car.

If not, we can send some which we guarantee will be. They have no chains or pins to get lost or broken, cars cannot overdump, are self-locking, self-centering, easy running and durable.

We also build dryer cars of all kinds for all purposes.



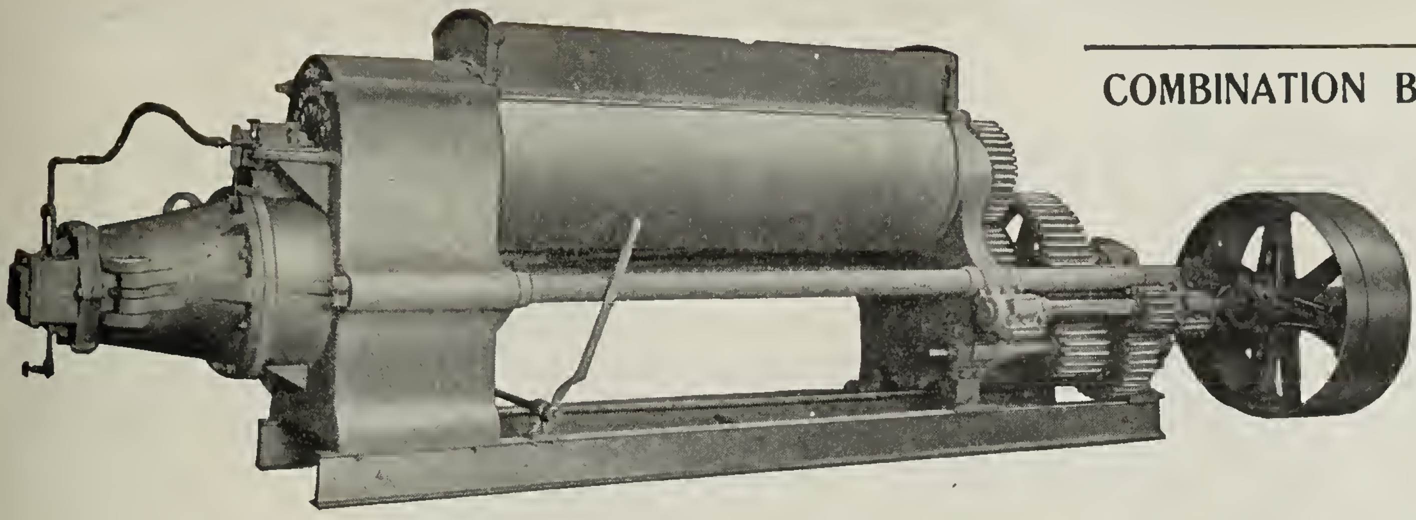
Richardson Double Die Repress.

The Richardson Repress has all the features of merit that are demanded of a machine of this kind. Has enough depth of mold to make the largest size paving brick. All the working parts are above dies out of the way of waste clay. It has a slow pressing movement with double pressure, bringing out distinctly all markings and lettering. The working parts are adjustible to wear. It requires very little power and costs little to keep in repair.

Kindly write us for catalogs and full information.

The Ohio Ceramic Engineering Company

50-56 Fall Street, Cleveland, Ohio.



COMBINATION BRICK MACHINE

THE

C. W. RAYMOND CO

Clay-Working Machinery

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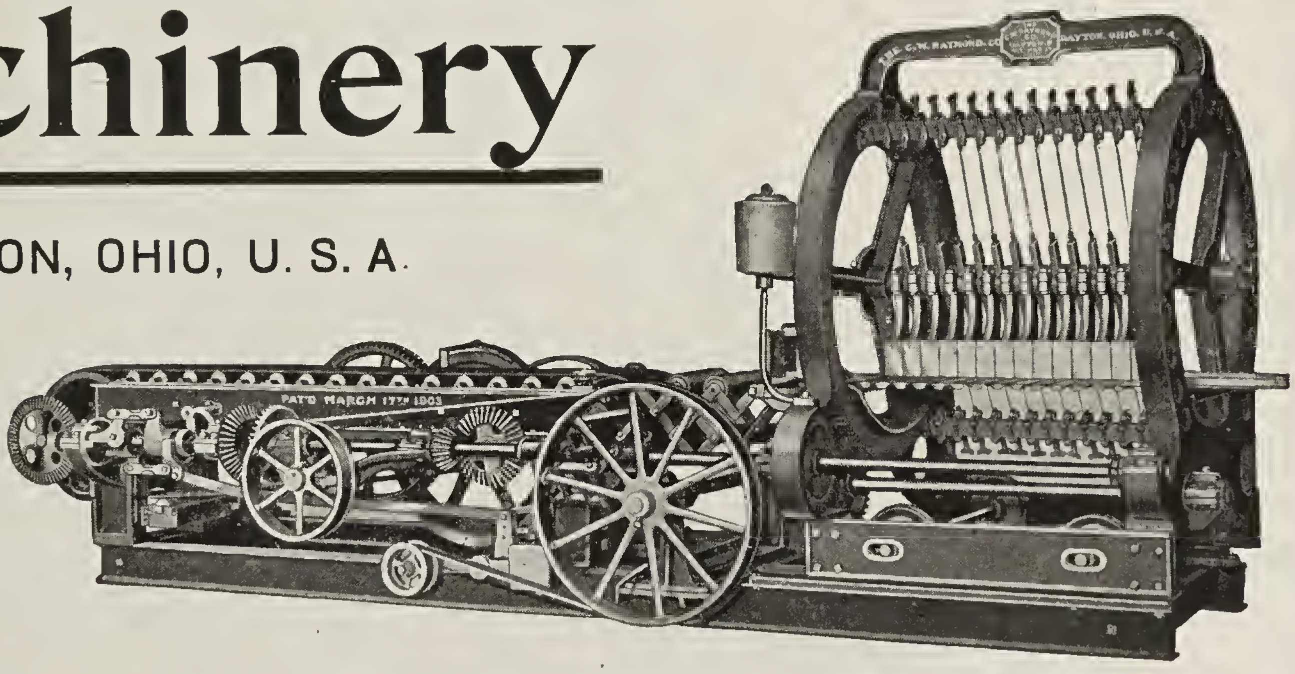
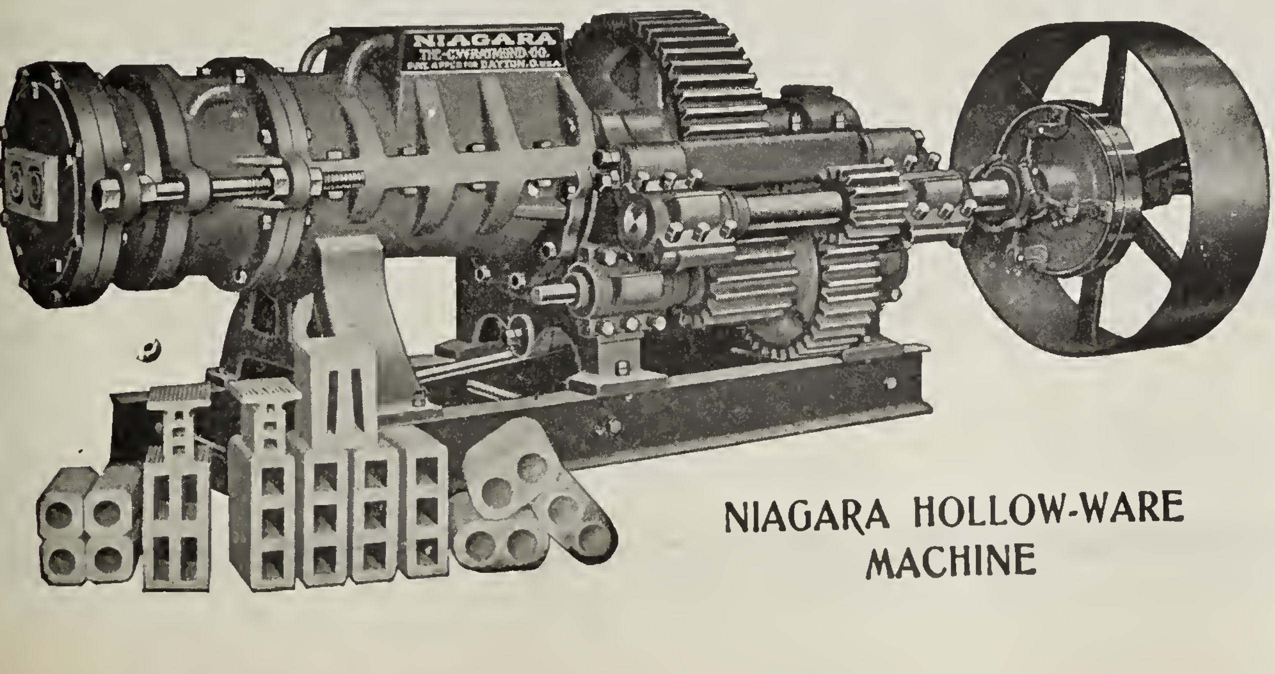


AUTOMATIC DOWN-CUT CUTTER



NIAGARA HOLLOW-WARE
MACHINE

Raymond Machinery
Creates New
Business for the User
Better Brick
and more of them.

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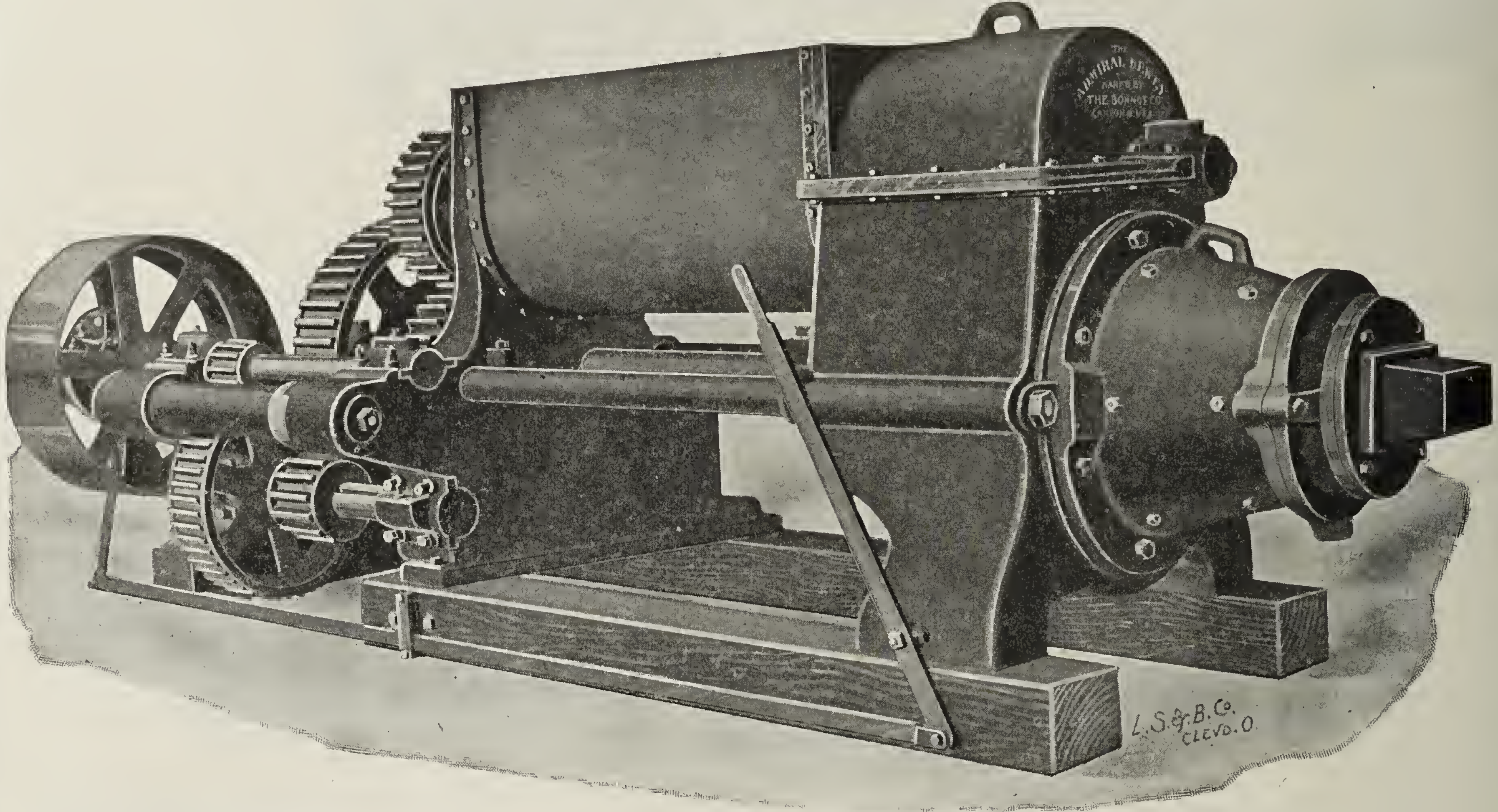
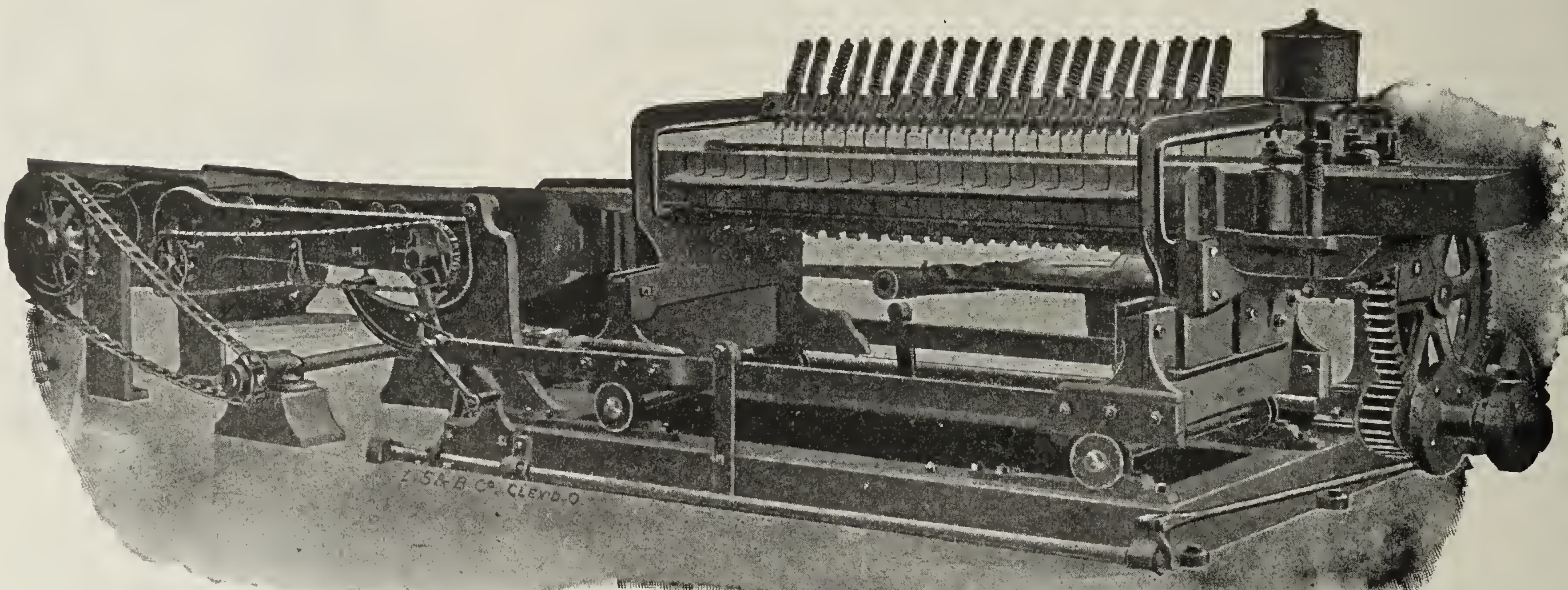
Modern Brick Machinery


THE ADMIRAL DEWEY MADE BY THE BONNOT CO. CANTON, OHIO
L.S.&B.Co. CLEVD.O.

SPECIAL COMBINED BRICK MACHINE AND PUG MILL 100,000 daily capacity.
AUGER BRICK MACHINES 10,000 to 100,000 capacity, five sizes.


L.S.&B.Co. CLEVD.O.

AUTOMATIC SIDE CUT TABLE. Simple, positive, durable.

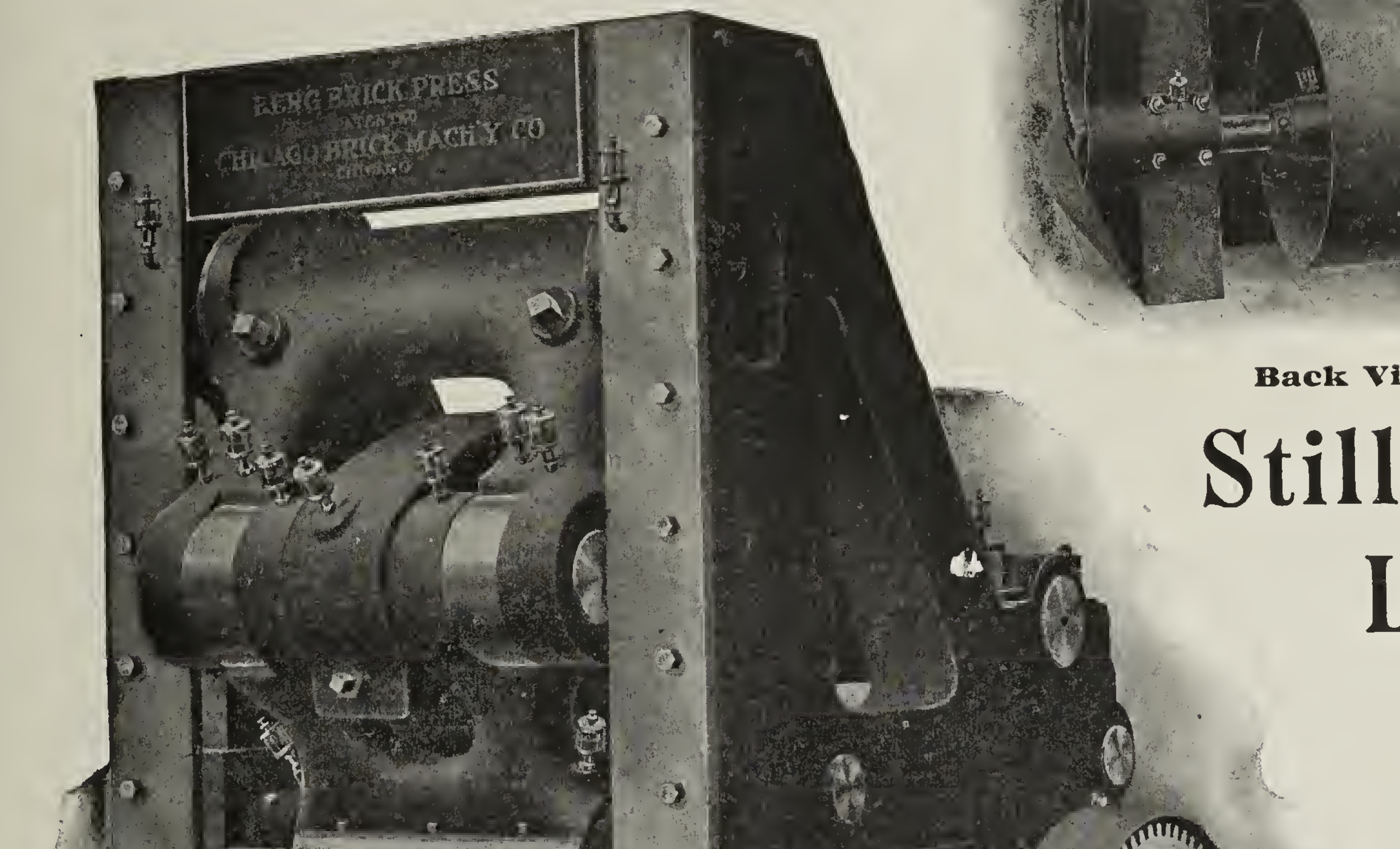
COMPLETE EQUIPMENTS FOR BRICKMAKERS. *ASK FOR CATALOGUE*

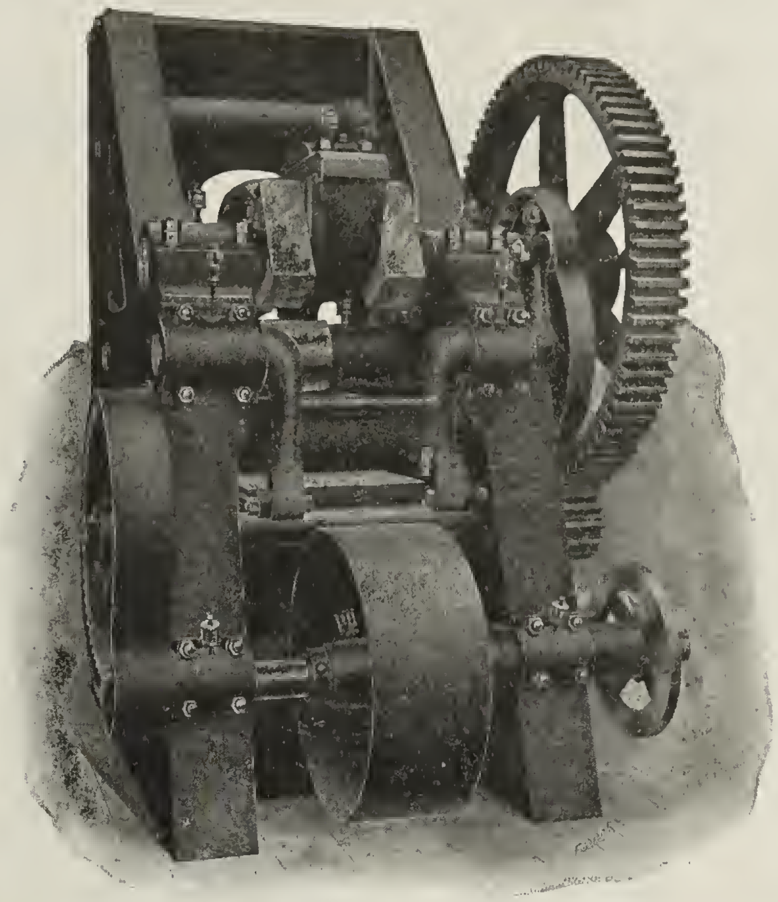
THE BONNOT COMPANY, Canton, Ohio.

—WESTERN AGENTS—
CHICAGO BRICK MACHINERY CO., - - 77 Jackson Boulevard, Chicago, Ill

NEW MODEL

BERG BRICK PRESS





Back View.

Still in the Lead

AND

One Step Further Forward

Even stronger than ever and all self-contained. Greater pressure and fewer working parts than any other machine. Simple, massive, compact. Running mechanism placed in rear, as shown in upper cut, enabling this machine to be SHIPPED IN ONE PIECE.

MANUFACTURED BY
ANDERSON FOUNDRY & MACHINE WORKS
Anderson, Indiana.

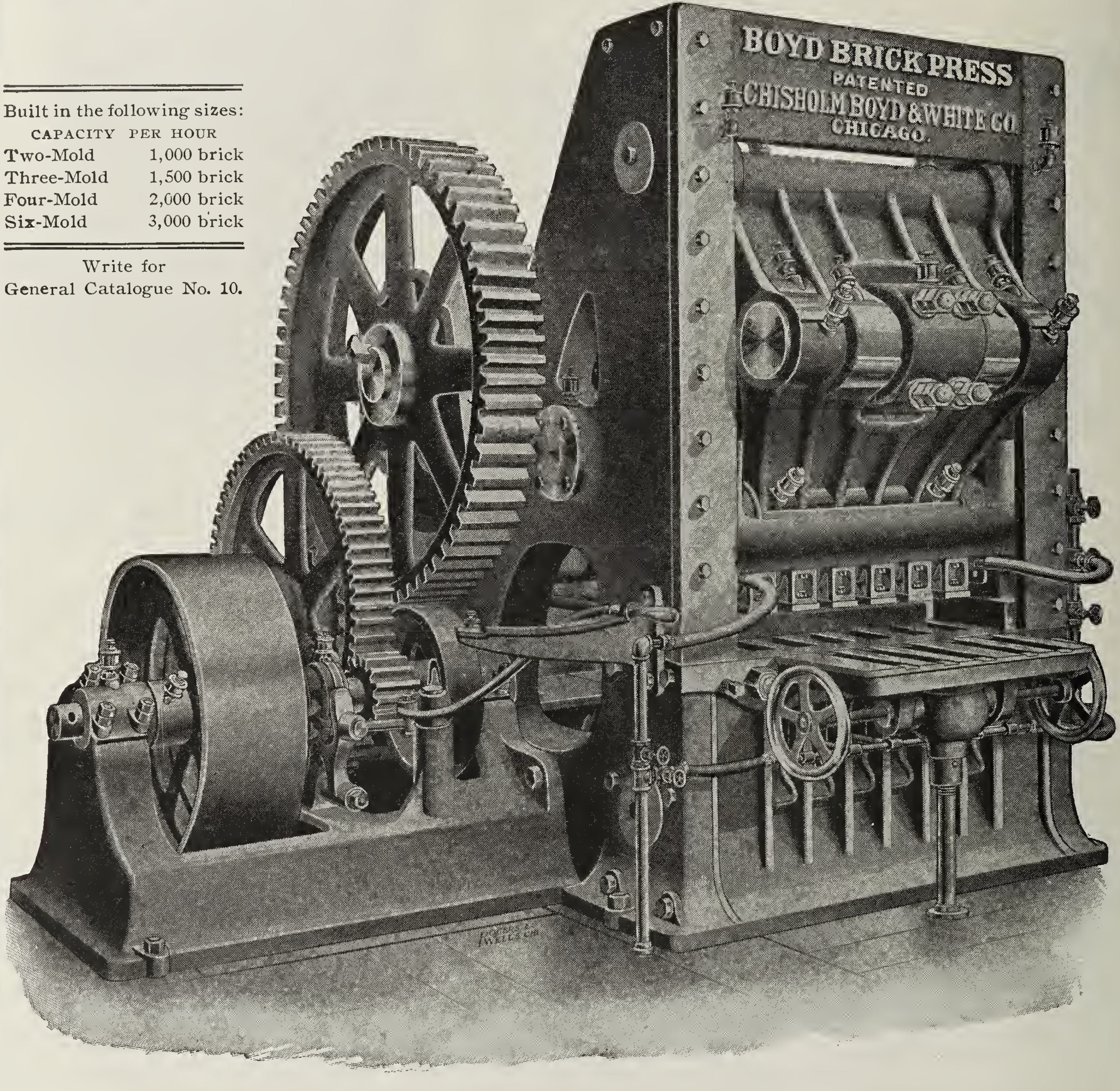
SOLD BY
CHICAGO BRICK MACHINERY COMPANY
77 Jackson Boulevard, Chicago.

The Boyd Brick Press

Built in the following sizes:

	CAPACITY PER HOUR
Two-Mold	1,000 brick
Three-Mold	1,500 brick
Four-Mold	2,000 brick
Six-Mold	3,000 brick

Write for
General Catalogue No. 10.



Another Record for the Boyd Press:

Six of our SIX-MOLD PRESSES in use on ONE YARD since 1892. Average cost of repairs for each machine One Dollar per year.

THE BOYD PRESS has always been distinguished for originality in design and construction. It will make better brick from clay or shale than can be made from the same material by any other press. It is selected and purchased by the most progressive Brick Makers. The largest and most successful brick plants in the country are using Boyd Presses.

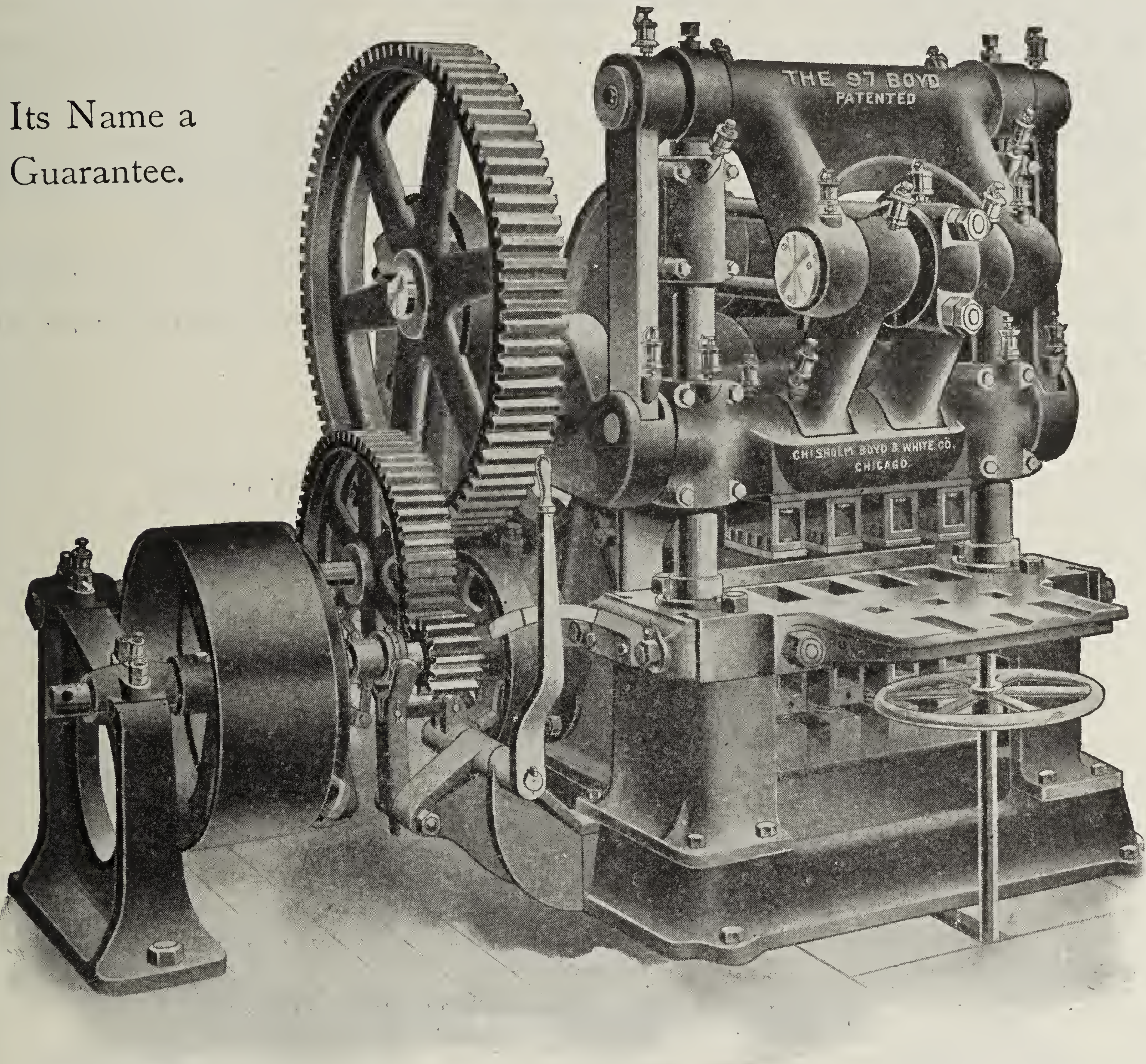
Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

The Boyd Brick Press

The '97 Model

Its Name a
Guarantee.



THE '97 MODEL BOYD BRICK PRESS has enormous strength and great durability; it is compact; the adjustments are convenient; it operates quietly and smoothly; the workmanship and material are of the best; the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking.

THE BOYD is the only Brick Press provided with an independent adjusting device for regulating the amount of clay in the molds and the pressure on the brick. This feature positively ensures equal pressure and finish on both sides of the brick, and no granulated or soft centers.

Sent on trial and fully guaranteed. Seventy presses of this pattern now in use. Cannot be broken in pressing brick. Write for descriptive catalogue No. 9.

Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

BRICKMAKERS:

The proof of every pudding is in the eating of it. Below are some remarks from one who has tried the pudding recently. We can produce much similar testimony from those whose experience stretches over a long period of years.

This is the age of great achievements, and in the field of Brick Press development we claim to lead them all.

Write for our catalog and let us tell you why the Ross-Keller is better for pressing Clay or Shale or Sand-Lime or Cement than any other.

VISTA HERMOSA
SUGAR AND MERCANTILE COMPANY
SUITE 1018 ASHLAND BLOCK
CHICAGO
Works at Vista Hermosa, Mexico

March 24, 1905.

Ross-Keller Triple Pressure
Brick Machine Co., St. Louis, Mo.

Gentlemen--We are pleased to inform you that the erection of our brick plant is now complete, and the Ross-Keller Press which we purchased of you is in good running order.

This Press is making the most beautiful brick we ever saw, and is giving us splendid satisfaction. We are more than pleased with the machine and can conscientiously recommend it to any one who is looking for a first-class, up-to-date Press.

We can see ahead of us a demand and a place for all the brick that we can make on the Ross-Keller, and the outlook for our brick enterprise is exceedingly promising.

With good wishes for your success, we beg to remain,

Yours very truly,
VISTA HERMOSA SUGAR & MERCANTILE CO.,
By DeWitt C. Bovee, Pres.

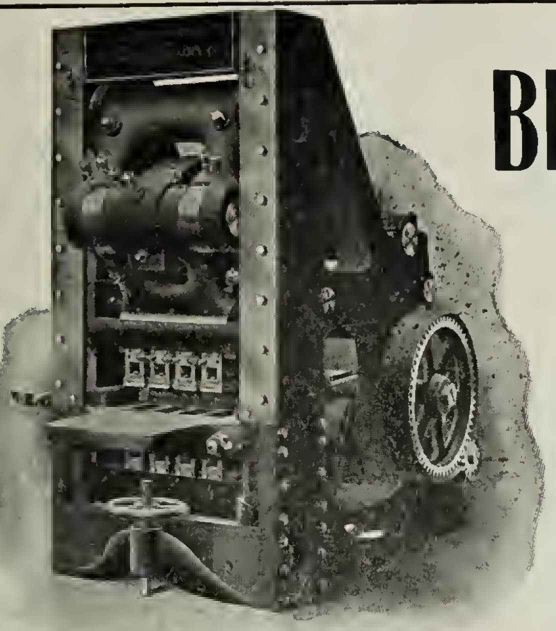
For prices and particulars address

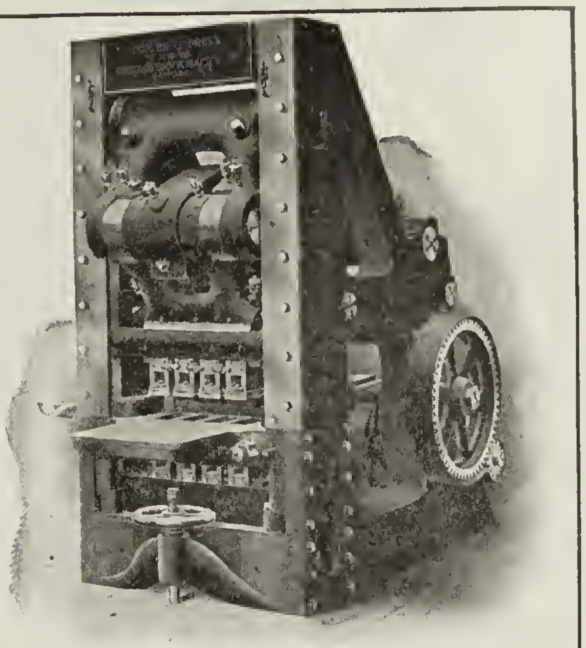
Ross-Keller Triple Pressure Brick Machine Co.

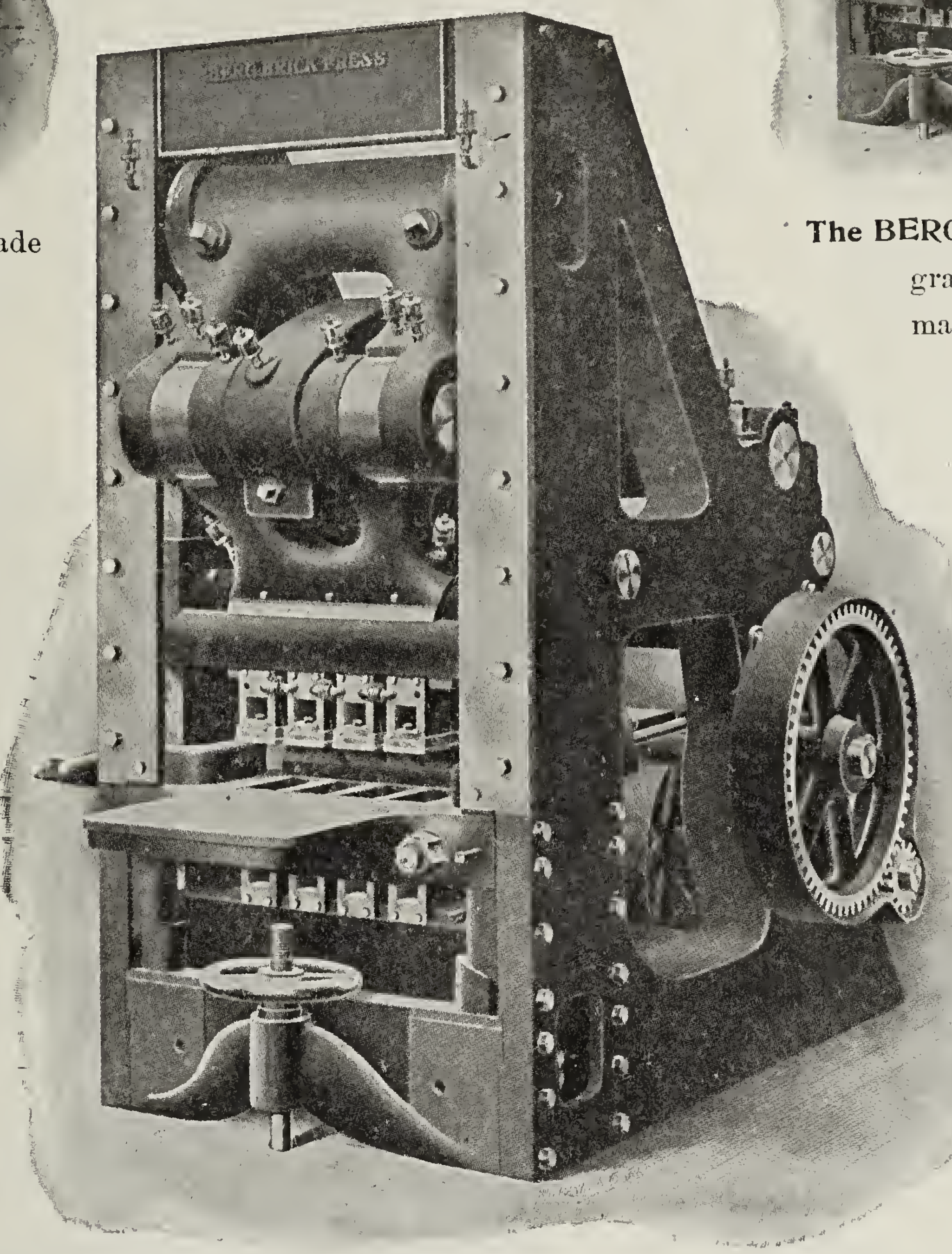
Fullerton Bldg., St. Louis, Mo., U. S. A.

BERG BRICK PRESS

The highest development of the Art of Brickmaking Machinery so pronounced by the United States Government.







The BERG for the highest grade of pressed brick of shale or clay. It makes all kinds of shapes and sizes of brick. Changes from one shape to another can be made in less than an hour's time.

First-Class Workmanship. Cut Gearing. Fully Warranted.

The BERG makes the best sand-lime brick and cheapest because it is the strongest machine and gives the highest pressure. Thirty-five sand-lime plants in United States use the **BERG** Brick Press SUCCESSFULLY.

The BERG MAKES the highest grade of fire brick. Can make all kinds of shapes desired for fire-brick purposes.

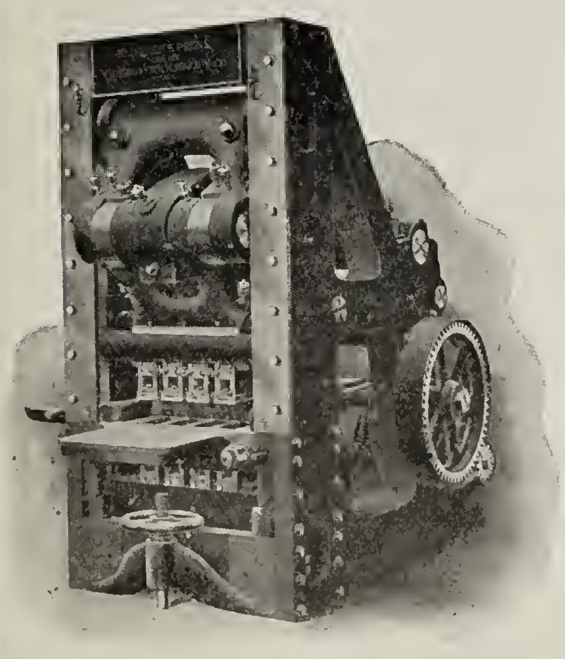
Three distinct pressures make the brick evenly pressed all through. No granulated centers of the brick.

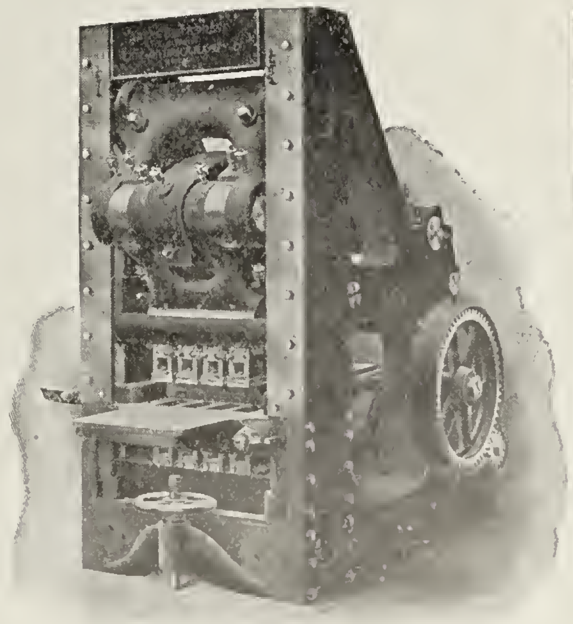
The BERG is the best for sand and cement because of its strong pressure. Uses less cement, makes cheaper brick.

The 1905 Berg Press

Many other steps further forward in improvement and highest grade of material and workmanship, also cut gearing. Fully guaranteed as to its success. Manufactured by its inventor in Toronto, Canada, at the Bertram Engine Works Co. Plans and specifications on the different kinds of plants furnished, also all equipments.

For prices and full particulars, address



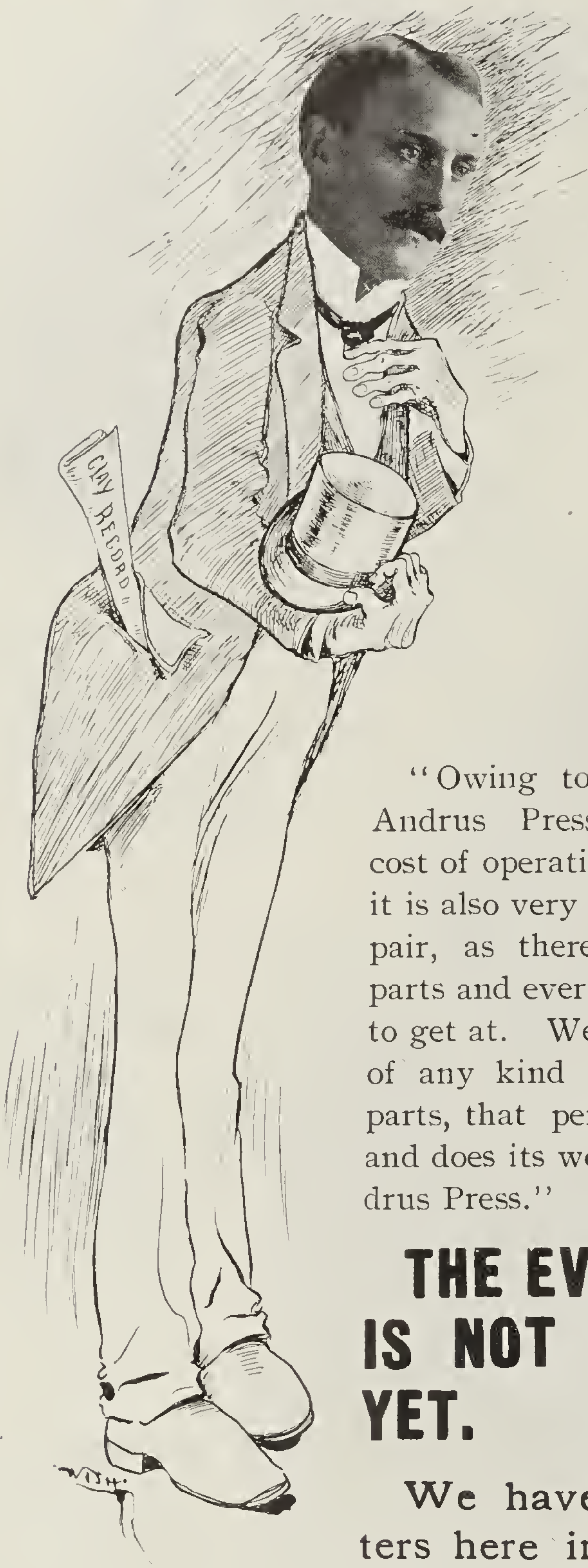


A. BERG
THE BERTRAM ENGINE WORKS
Toronto, Ontario, Canada

Even the Editor

Took Off His Hat

When We Cited the Following Instance:



Anthony Ittner Brick Company, with offices in the Odd Fellows Building, here in our city, have seven Andrus Presses on their yard at Bellville, Ill.

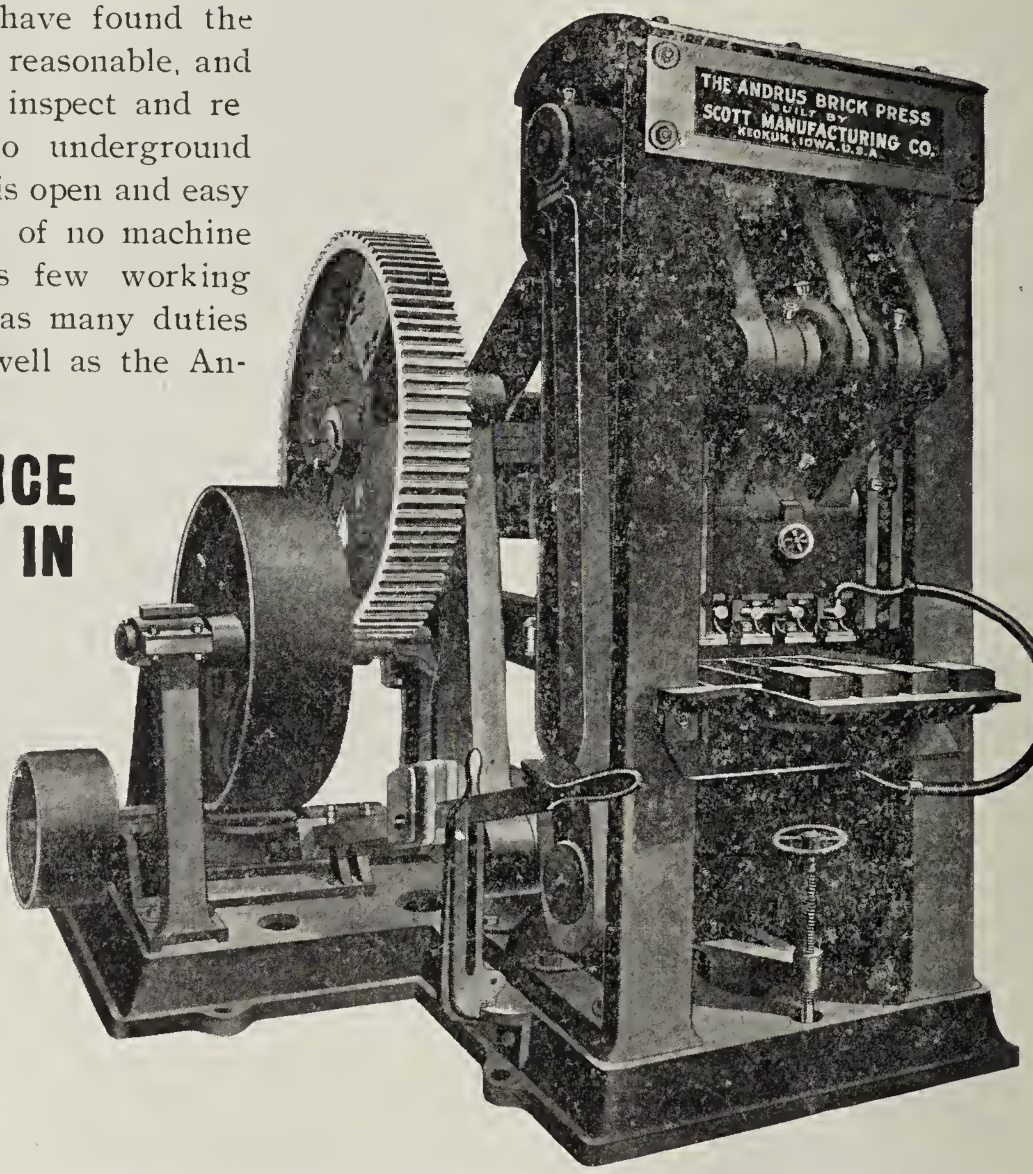
To show what they think of the machine illustrated below, we quote the following from their letter of recommendation:

"Owing to the simplicity of the Andrus Press, we have found the cost of operation very reasonable, and it is also very easy to inspect and repair, as there are no underground parts and everything is open and easy to get at. We know of no machine of any kind with as few working parts, that performs as many duties and does its work as well as the Andrus Press."

THE EVIDENCE IS NOT ALL IN YET.

We have letters here in our office from almost every state in the Union, all of which corroborate the above statements.

In addition to letters of recommendation, we have eighteen Andrus Presses in the St. Louis district "making brick every day."



THIS IS THE PRESS THAT SCOTT BUILDS.

SCOTT MANUFACTURING COMPANY

WORKS:
Keokuk, Iowa.

Commonwealth Trust Building

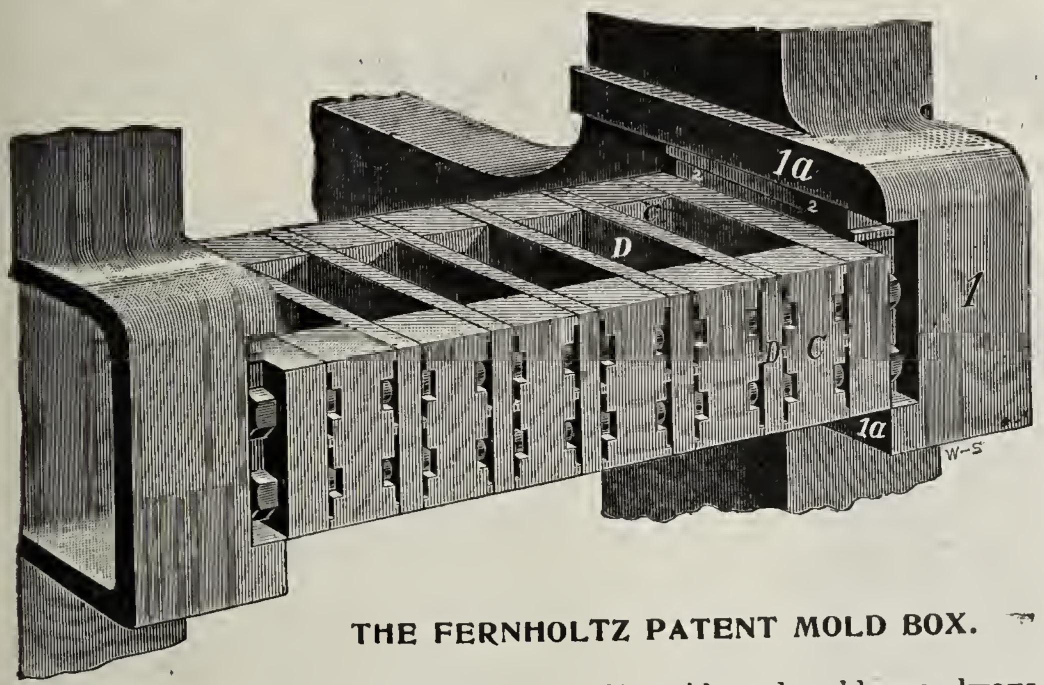
ST. LOUIS, MO.

THE FERNHOLTZ BRICK MACHINERY CO.

Manufacturers of

The Celebrated Fernholtz Dry Press

Four mold Press 20,000 daily capacity. Six mold Press 30,000 daily capacity



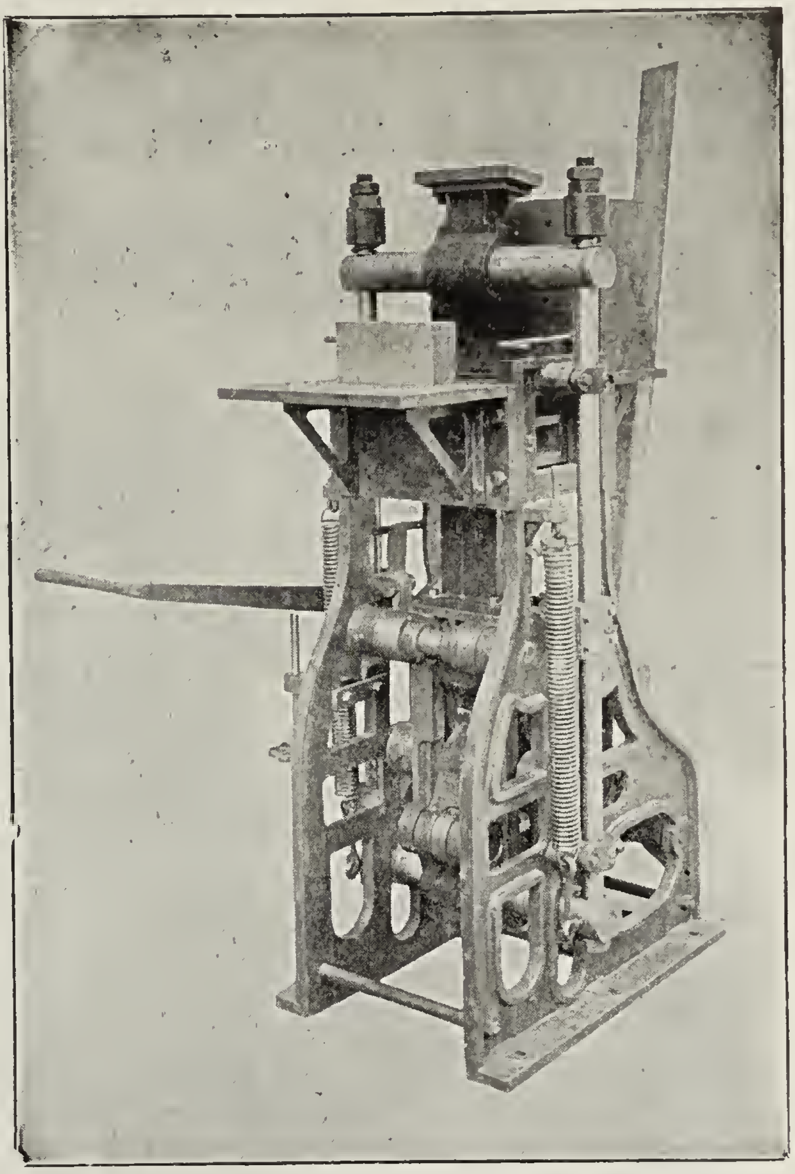
THE FERNHOLTZ PATENT MOLD BOX.

No old style Liners. The Blocks are adjustable and molds are always one size. We have put them in most all makes of Dry Press machines. Easily and quickly adjusted. They are made entirely out of chilled iron, the hardest known metal.

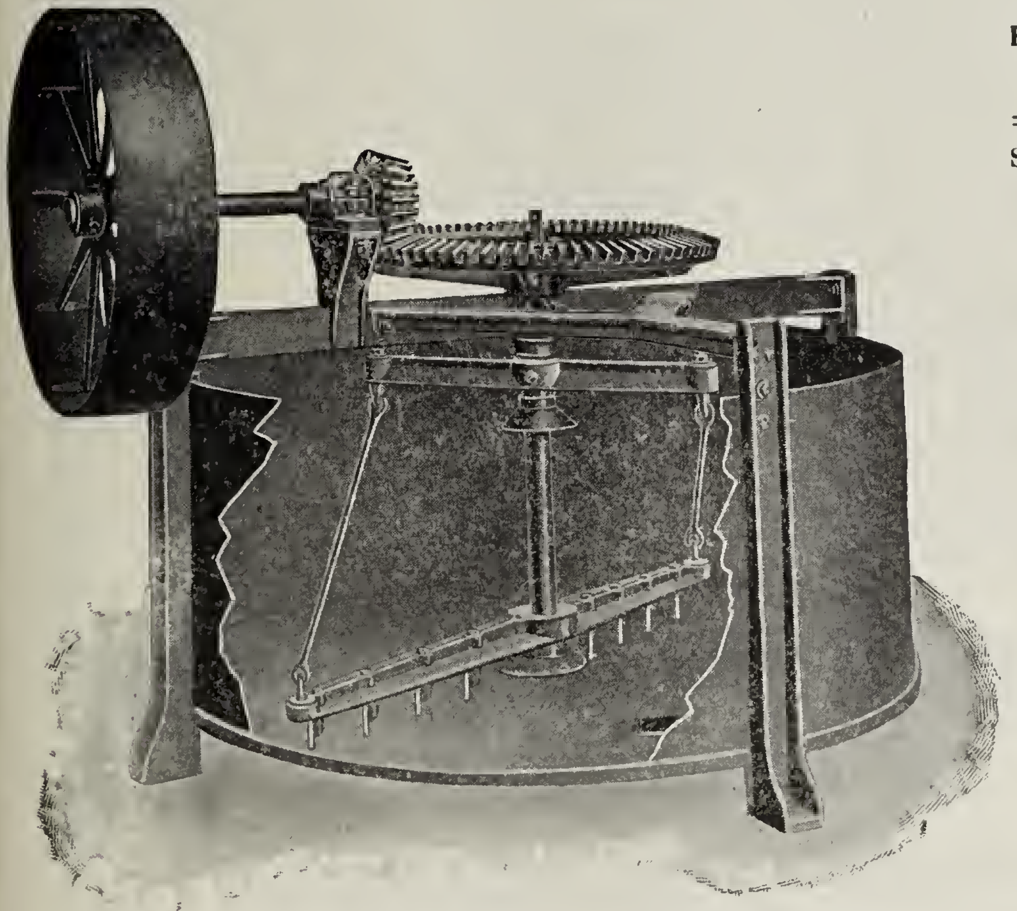
GRATH PATENT HAND POWER PRESS.

Especially adapted for ornamental designs Any size brick up to 12⅝ inches long, 10 inches wide and 4¼ inches thick.

Brick set into kiln direct from press.



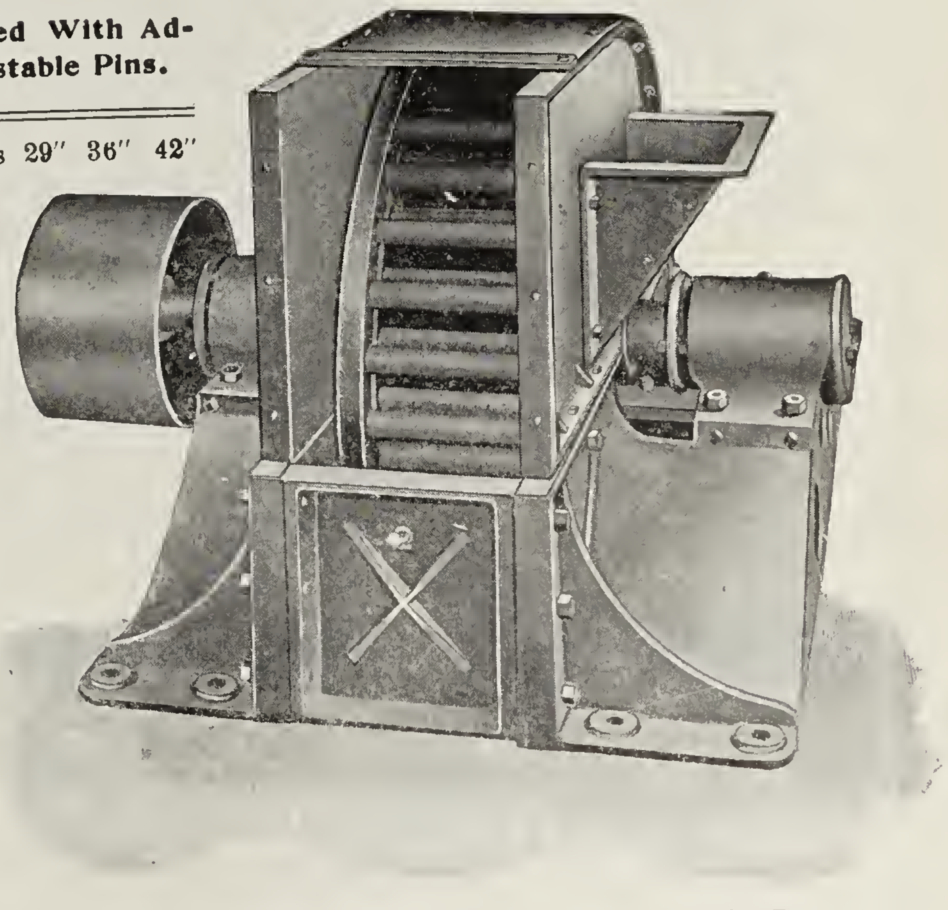
GRATH PATENT HAND POWER PRESS.



A GOOD MIXER IS ALWAYS APPRECIATED.

Fitted With Adjustable Pins.

Sizes 29" 36" 42"



THE FERNHOLTZ CLAY PULVERIZER.

The Fernholtz Brick Machinery Co.

Cable Address "Fernbrick." Western Union Code.

Boyle Avenue and Old Manchester Road, ST. LOUIS, MO., U. S. A.

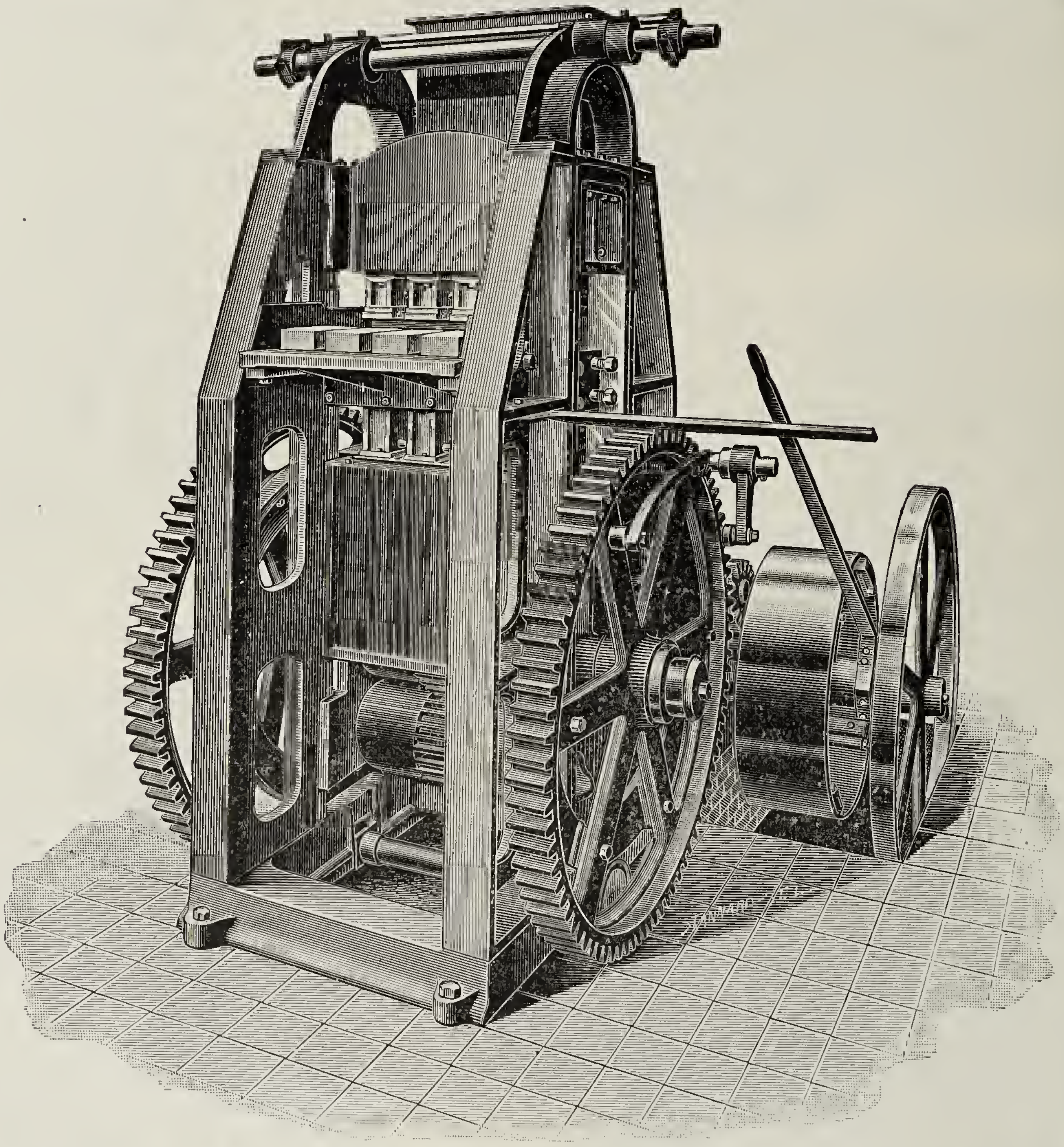
PERFECTION REALIZED

IN THE

RELIANCE DRY PRESS BRICK MACHINE

(PATENTED)

Main
Features:
Strength
Durability
Simplicity
Saves Fuel
and
Costs Less



No
Toggles
No
Links
No
Pins
to
Wear

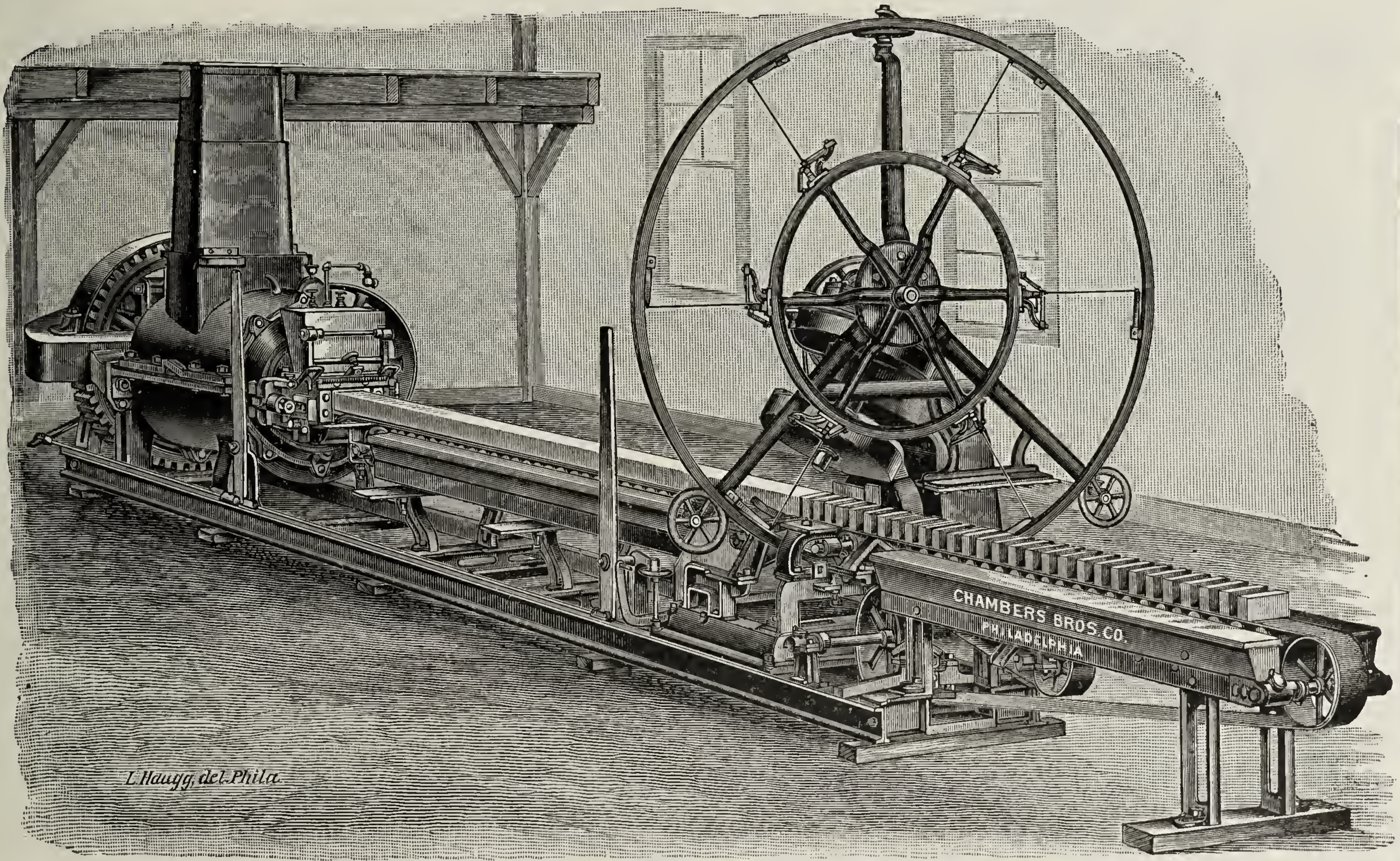
STRONGEST AND MOST POWERFUL BRICK PRESS ON THE MARKET

FOR PRICES AND FURTHER PARTICULARS ADDRESS THE

RELIANCE MACHINE AND TOOL WORKS
ST. LOUIS, MO.

MACHINERY FOR BUILDING BRICK AND FOR STREET PAVERS

ROUND CORNER PAVING BRICK WITHOUT REPRESSING


CHAMBERS BROS. CO.
PHILADELPHIA
L. Haugg, del. Phila.

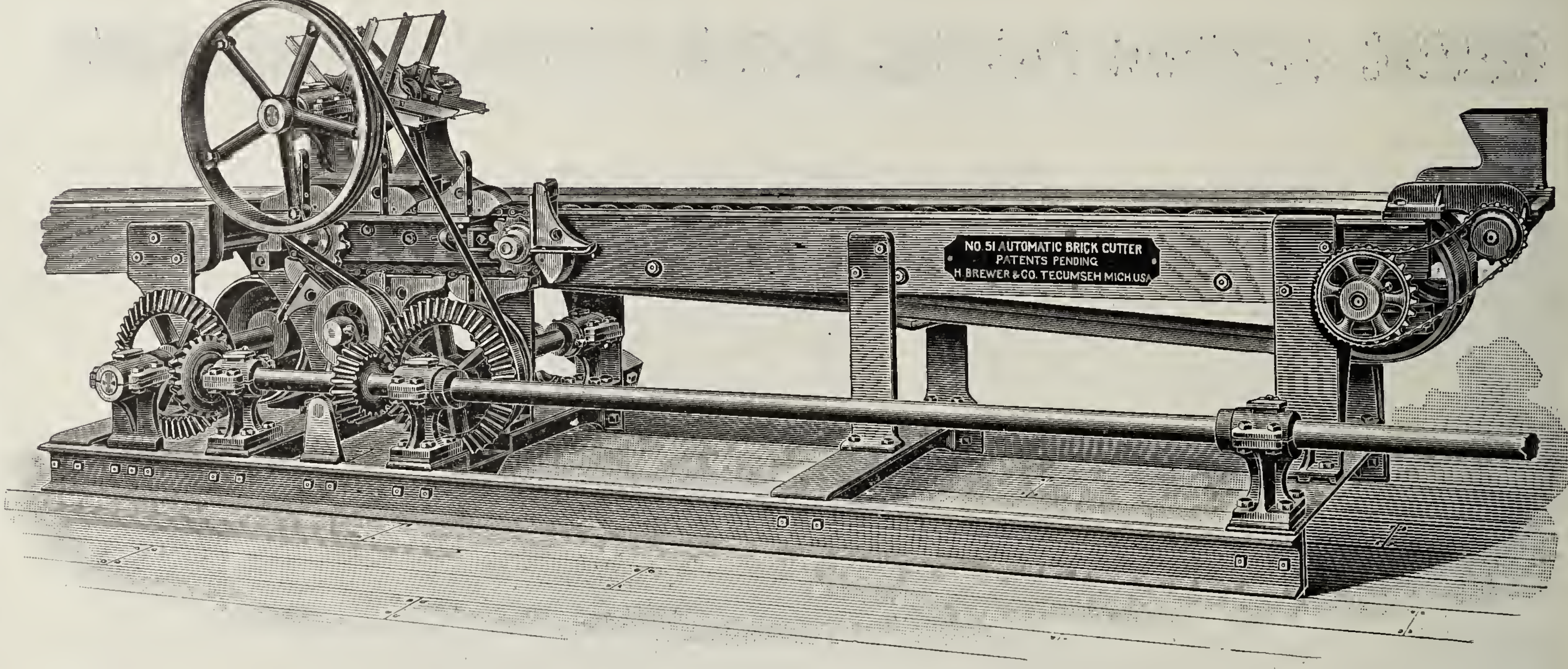
THE CHAMBERS AUTOMATIC SIDE-CUT BRICK MACHINE.

Automatic End Cut Brick Machines of five sizes, having capacity from 10,000 to over 100,000 brick daily under favorable conditions.

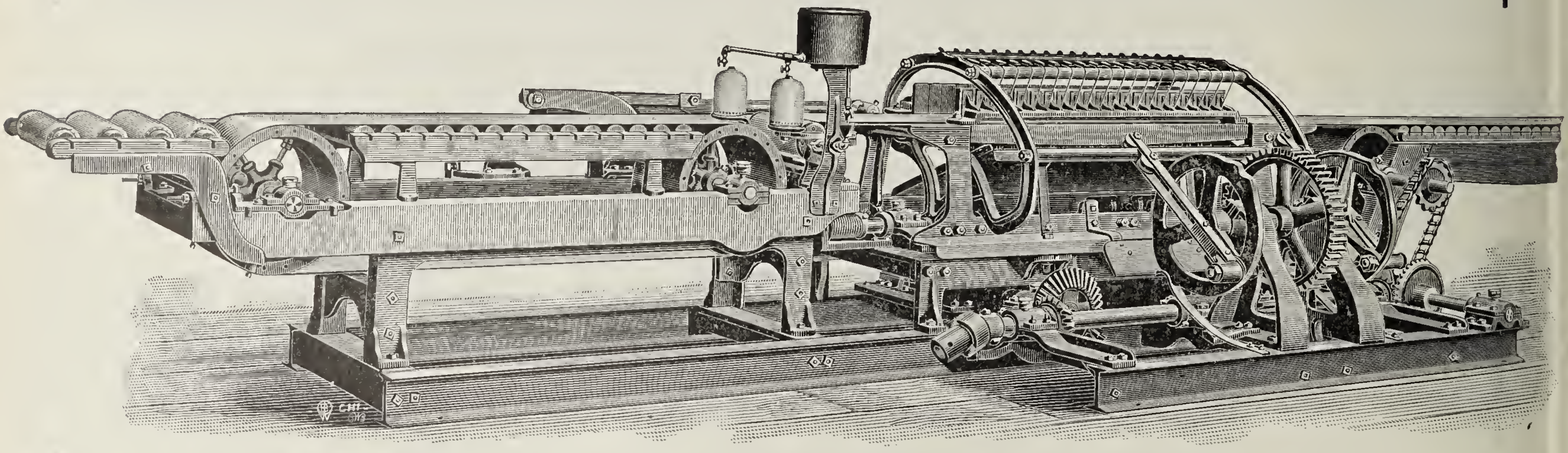
CHAMBERS BROTHERS COMPANY
52D AND MEDIA STREETS
PHILADELPHIA, PA.

E. R. FRAZIER, Chicago Agent,
59 West Jackson Boulevard.

Cutting Machines

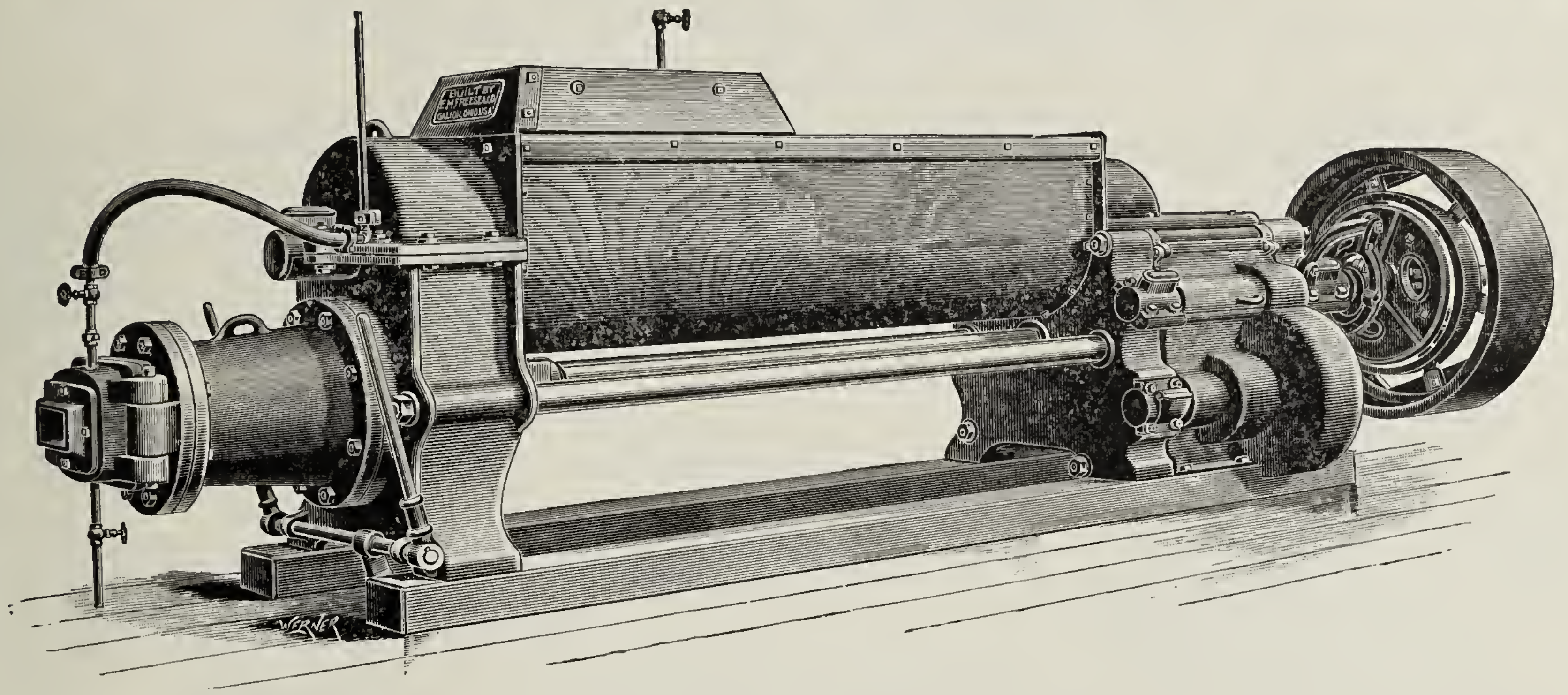

NO 51 AUTOMATIC BRICK CUTTER
PATENTS PENDING
H. BREWER & CO. TECUMSEH MICH USA

The Brewer line of Automatic Clay Cutting Machines is complete, embracing numerous desirable features of strength and simplicity of design, which the modern clay worker appreciates. They are all good machines in every sense of the word. Built from good material by good workmen. Sold by good, honorable methods and covered by good guarantees. There is nothing better. Tell us your cutting requirements and we will tell you what we will guarantee to do for you.



H. BREWER & CO., TECUMSEH, MICHIGAN.

UNION BRICK MACHINES


BUILT BY
E. M. FREESE & CO.
GALION, OHIO U.S.A.
WERNER

We build these Machines in five sizes. Capacities to 10,000 brick per hour.

Several hundred are in everyday use. They do first-class work and are convenient, economical and durable. This can be verified by investigation.

We also build Brick Machines with separate Pug Mill.

Don't forget our Automatic Cutters. **They give satisfaction.**

State your requirements and let us furnish particulars.

E. M. FREESE & CO.

GALION - - - - OHIO

LAMINATION is the source of more loss, more worry and more anxiety than all other troubles of a brickmaker

---

KENTON C READ, Pres. ANDY O'CONNELL, Vice Pres. and Gen'l Mgr C. M. MILLER, Sec.-Treas.

THE

C. M. Miller Mfg. and Mining Co. Inc.

MAKERS OF

High Grade Veneer and Building Brick

Office, 331 Ohio Street.

New Phone 1142.

Terre Haute, Ind. Dec. 22. *190*4.

Mr. H. L. Hix, Mgr.
The Wallace Mfg. Co., Frankfort, Ind.:

Dear Sir—I feel that I must tell you my experience with the brick made on the Intermediate Wonder:—

A few days ago a very prominent contractor asked me to bring him some samples of our brick. I fixed up some samples and started to his place, and just as soon as he saw them, he said: "I don't want them—they are no good; I would not lay one of that kind of brick," but I begged him to look at them and tell me why he did not want them. He asked me if he could break one of them, and I said, "Yes, break all of them." So he took his hammer and hit one on the corner; then he looked up at me and said: "I never saw a stiff mud brick like that;" then he broke it all up, just as nice as any brick, and he said: "That is the first stiff mud brick I ever saw without lamination," and that they were all right.

We are now selling our brick as fast as we can deliver them.

Pardon me for taking your time, and with SUCCESS to the WONDER, I am,

Yours very truly,

Andy O'Connell
V P and Gen Mgr.

In the event that you want to make brick filled with LAMINATION, CRACKS and CROOKS, a Wonder Machine will not answer your purpose.

THE WALLACE MFG. CO.

FRANKFORT, IND., U. S. A.

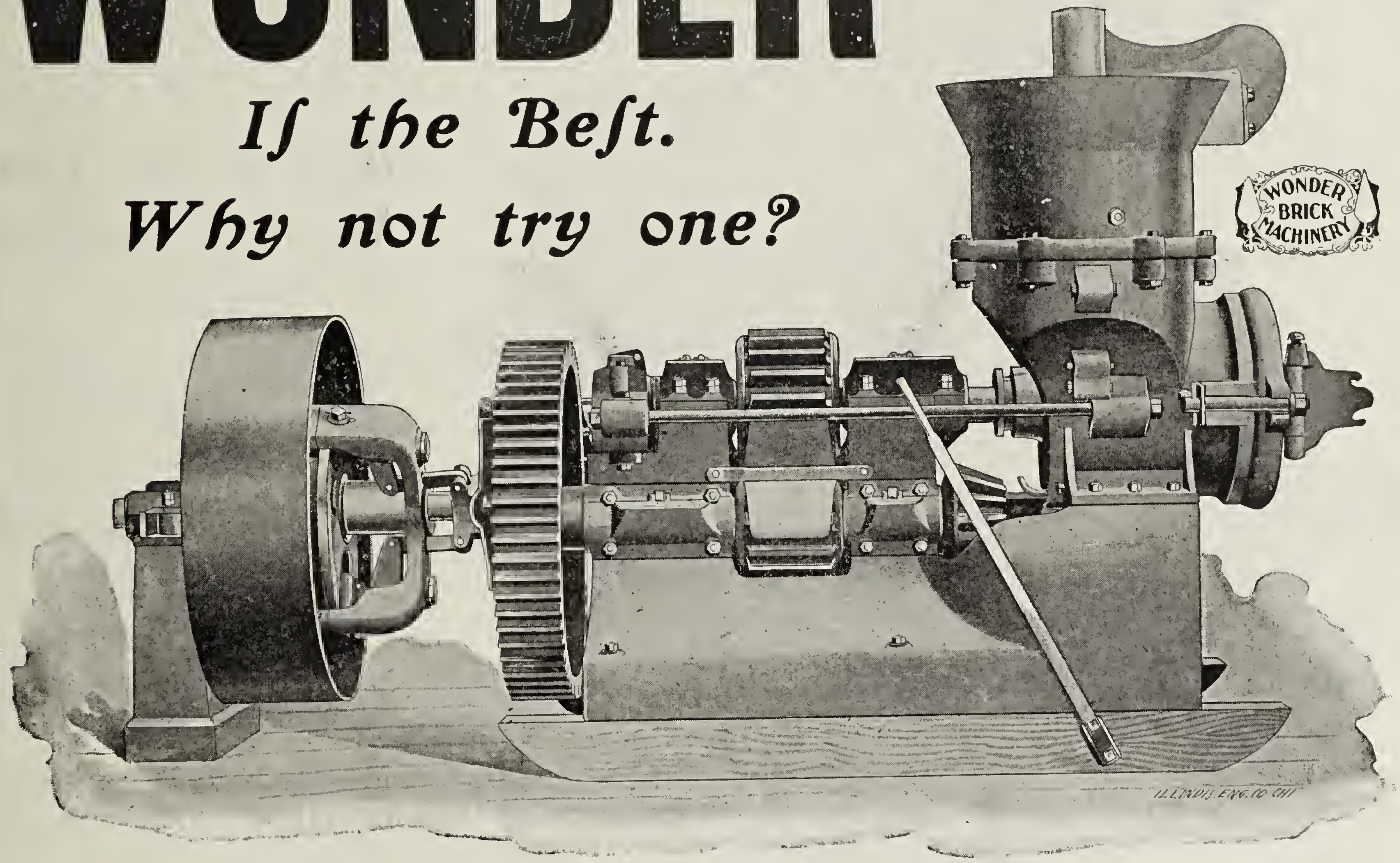
NO DOUBT ABOUT IT—

It is a Fact, conceded by every User, that the

WONDER

Iſ the Beſt.

Why not try one?



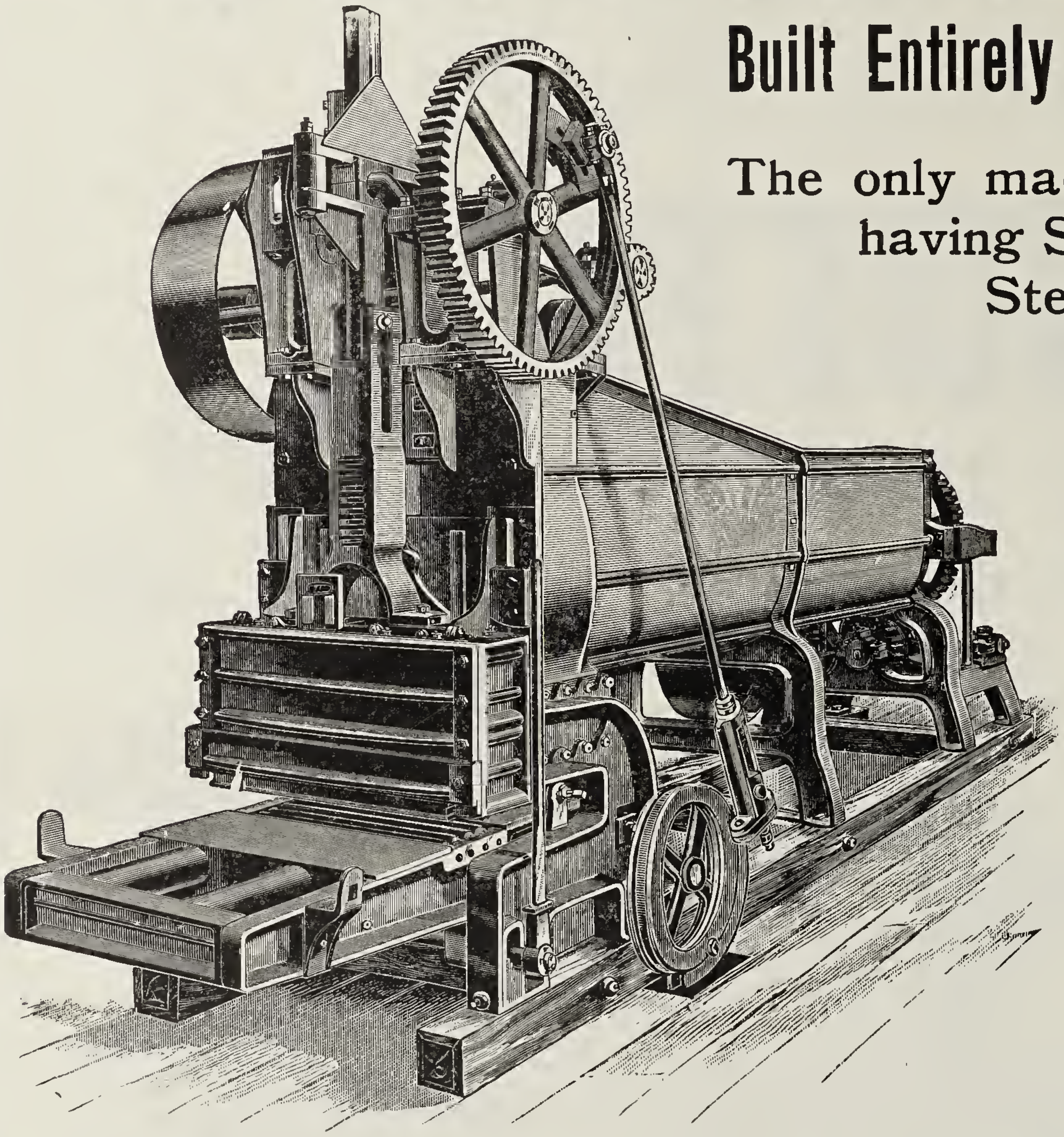
We Have the Best Roofing Tile Proposition ever offered to the trade.
Write Us: Let us tell you about it.

The Wallace Mfg. Co.

FRANKFORT, IND., U. S. A.

THE POTTS

HORIZONTAL BRICK MACHINE



Built Entirely of Iron and Steel.

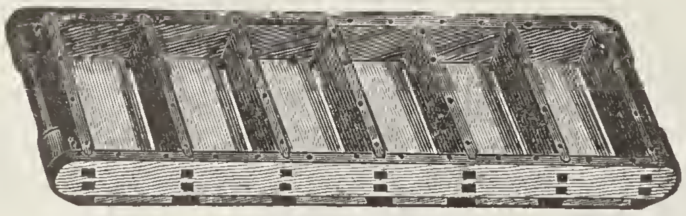
The only machine of this class having Steel Gear and Steel Shaft.

Built of the Best Material by the Best Workmen.

Simple, Strong and Durable.

No extra pug mill required to enable working the clay direct from the bank. Its great strength enables working the clay as stiff as practicable, insuring brick which will be STRAIGHT and SQUARE.

THE LEADER OF ALL SAND MOULD MACHINES.



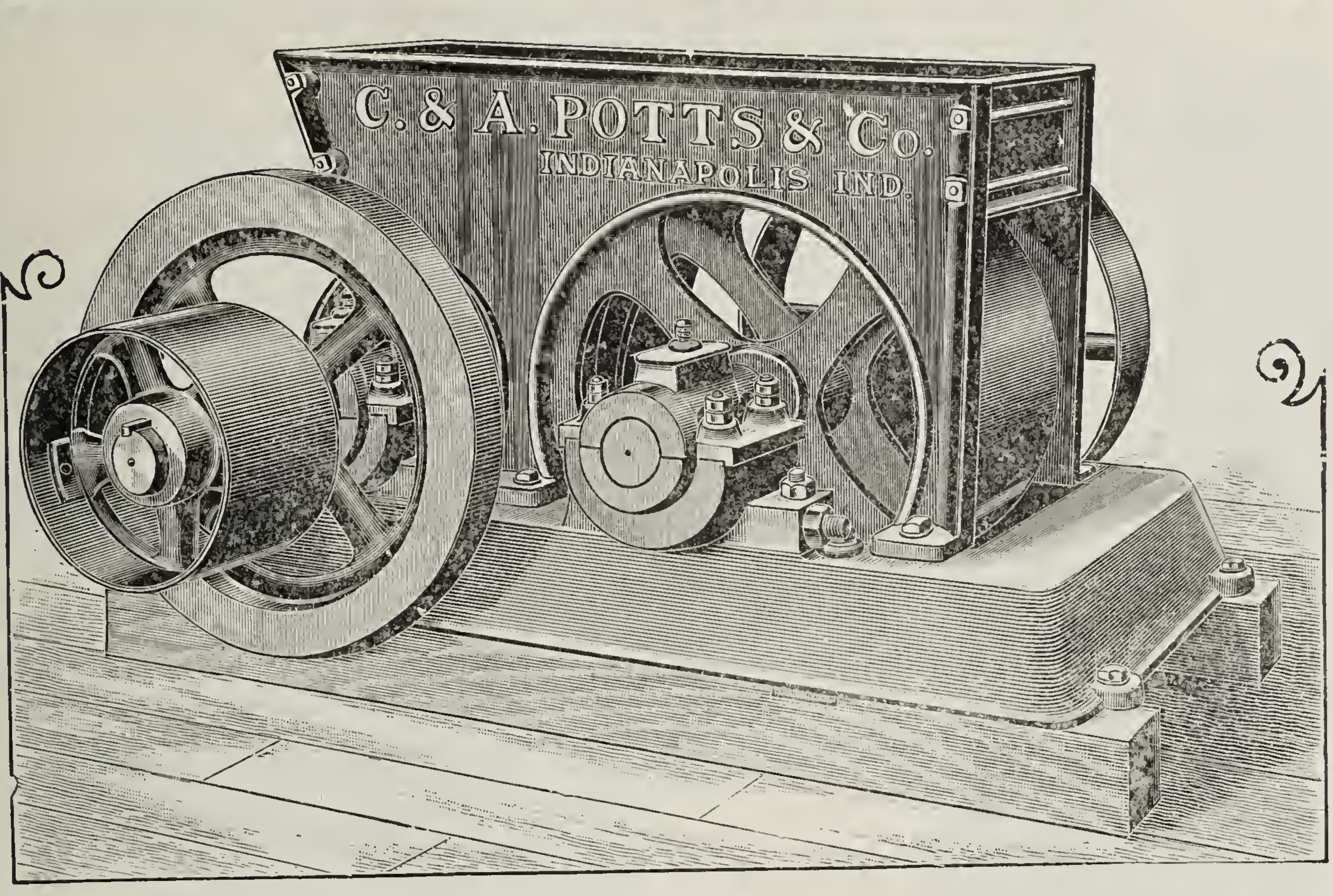
BRICK MOULDS A SPECIALTY

QUALITY IS OUR AIM.

We manufacture a complete line of Brick Yard Supplies. Write for prices.

C. & A. POTTS & CO., Indianapolis, Ind.

THE POTTS DISINTEGRATOR


C. & A. POTTS & Co.
INDIANAPOLIS IND.

Is not a spite machine, but is built the best possible. Having Heavy Chilled Rolls, Ring Oiling Bearings, Shafts of Steel and large in Diameter. The most successful machine for grinding out sticky clays and separating the stone.

THE POTTS MOULD SANDER

Simple in Construction,

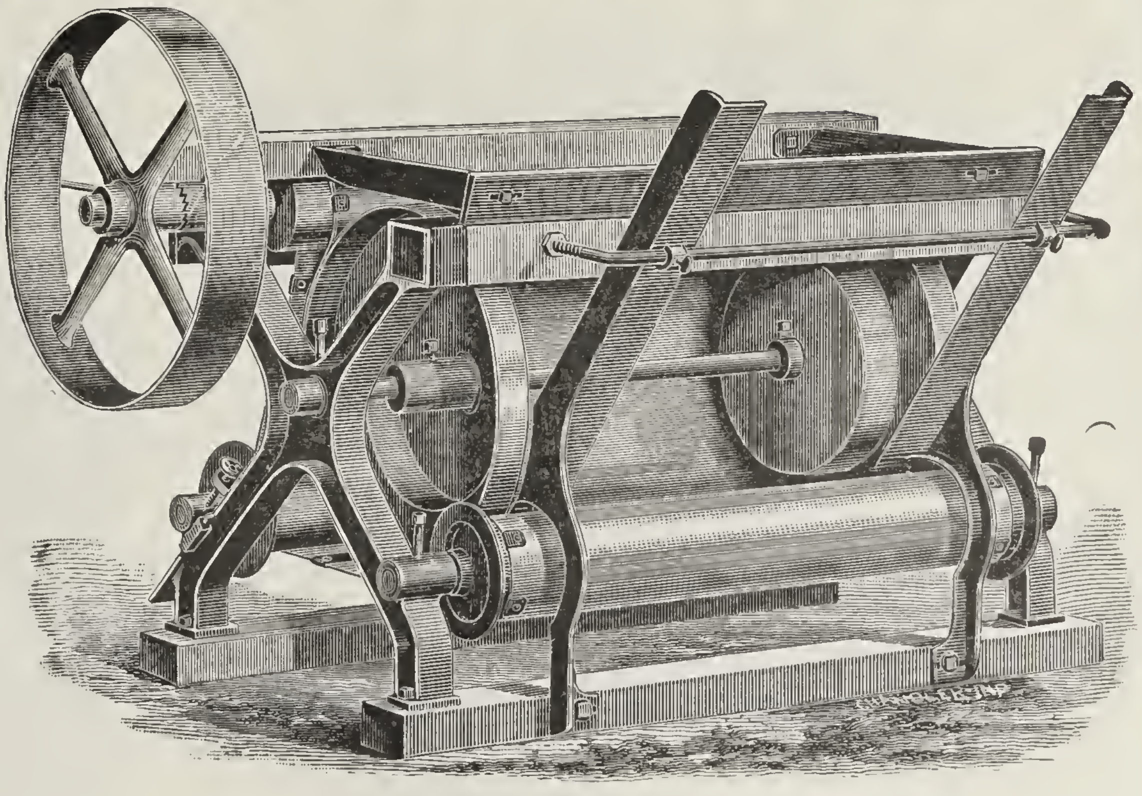
Strong and Durable,

Sands the Moulds Perfectly,

Never Strikes or gets Drunk,

Always Ready for Work,

No Brick Machine Complete without this Machine.



Patented February 5, 1889.

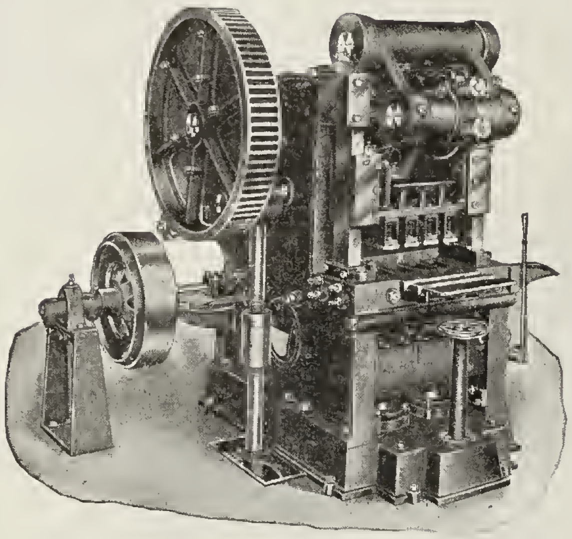
We make a specialty of equipping Sand Mould plants complete. We are the largest manufacturers of this class of machinery in the world. Write for prices.

C. & A. POTTS & CO., Indianaoplis, Ind.

Built Right
Run Right

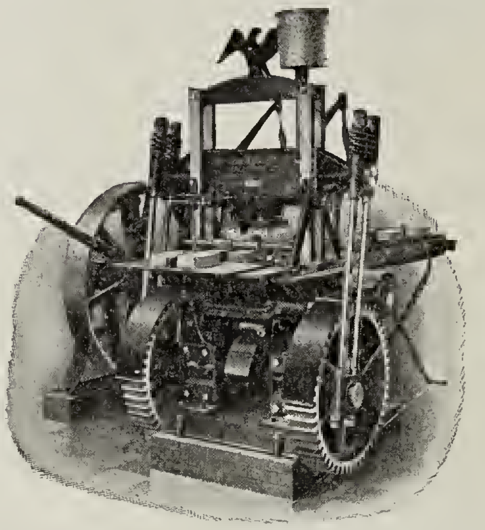
The American Clay Machinery

These are a few of the many Superior machines we manufacture for the Clay Trade. Large cuts



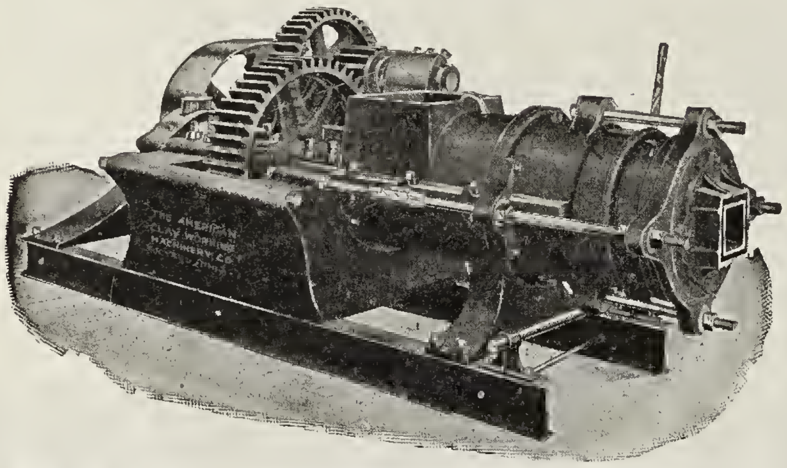
DRY PRESS BRICK MACHINERY.

We build a full line of Dry Press brick machinery. We have four styles and eight sizes, ranging in capacity from 1,000 to 3,000 brick per hour. This cut is our four mold, Moldel B press, especially adapted to Sand-Lime brick. Write for complete catalogue.

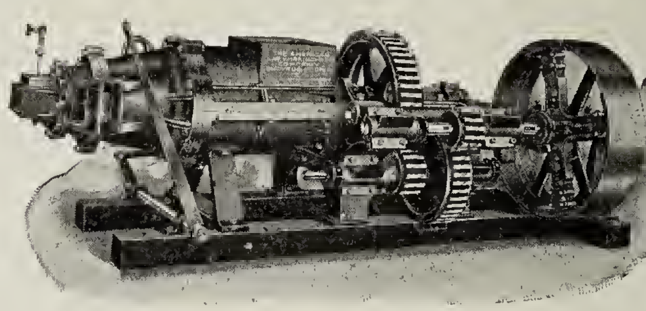


REPRESSES.

We build a large and complete line of represses in six sizes and styles. Capacity runs from 600 to 2,500 brick per hour. Send for our complete catalogue. This cut is of our double mold Eagle Repress.

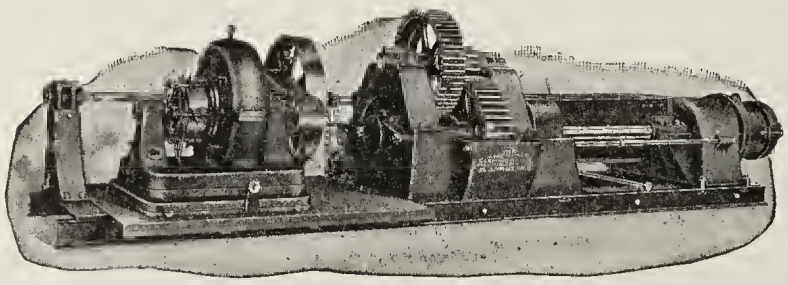


No. 40 AUGUR MACHINE FOR HOLLOW WARE.



No. 2 GIANT AUGER BRICK MACHINE.

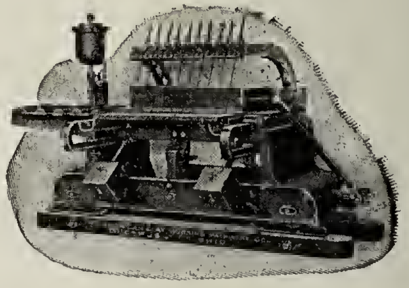
We build ten sizes and styles of Auger Machines. Capacities 1,500 to 10,000 brick per hour. Write for complete list.

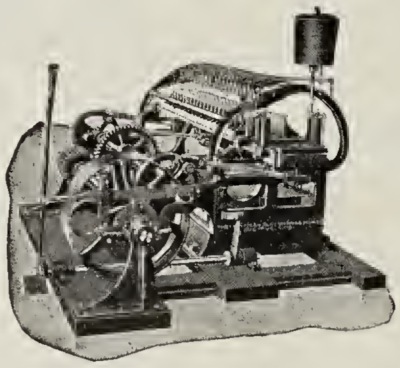


No. 23 ELECTRICAL DRIVEN, LOW FRAME, COMBINED MACHINE.

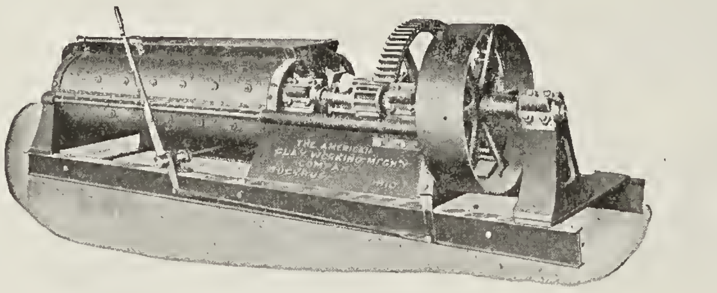
We make a full line of electrical driven clay-working machinery. Send for catalogue.

SEMI-AUTOMATIC AND HAND POWER CUTTERS





We make twenty-five styles of semi-automatic and hand power cutters for brick, tile and hollow ware. Write for full list and description.

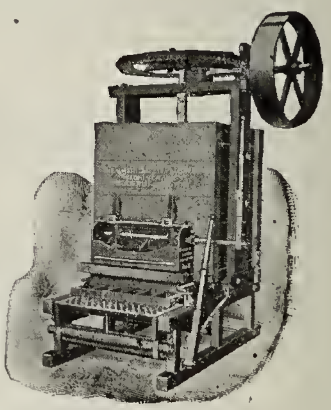


No. 38 DOUBLE SHAFT PUG MILL.

We build twenty different styles and sizes of pug mills to suit the needs of varying clays. Send for complete list and description.

SOFT MUD BRICK MACHINES.

Our Eagle Steam and Horse Power Brick Machines are the best built for small capacity. They are complete with molds, etc. Write for our soft mud booklet. These machines are especially adapted for export.



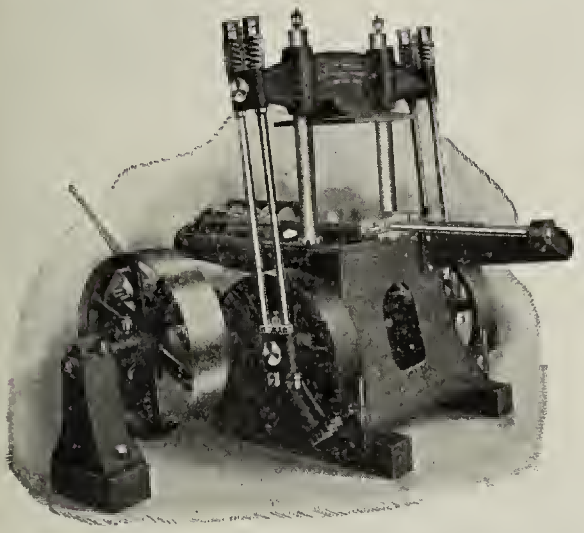
Built Right
Run Right

Dry Press, Stiff Mud and Soft Mud Brick Machinery. Sand-Lime Brick Machinery, Cement, and Pottery Machinery. Waste Heat and Steam Dryers
Everything needed by the Clay Workers.

Company, Bucyrus, Ohio, U. S. A.

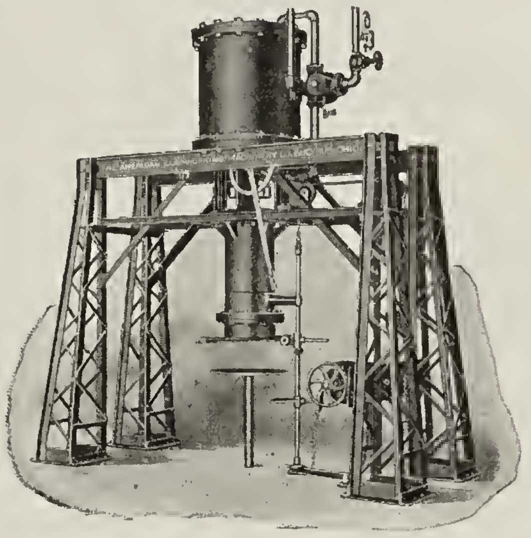
Built Right Run Right

and full descriptions of these and a hundred other machines we make will be sent upon request.



ROOFING TILE PRESS.

We build four styles of Roofing Tile Presses for the pressing of Hip Rolls, Crestings, etc. Write for complete description.



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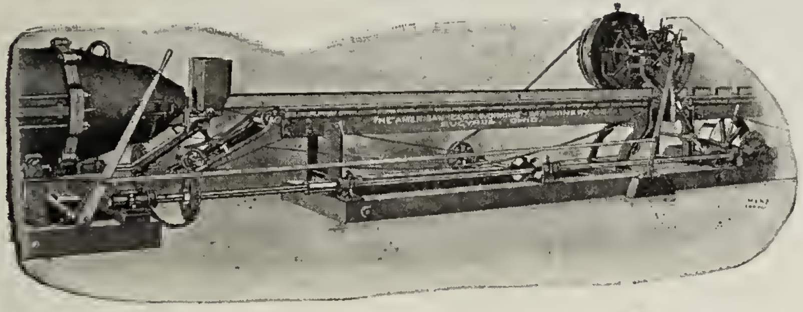

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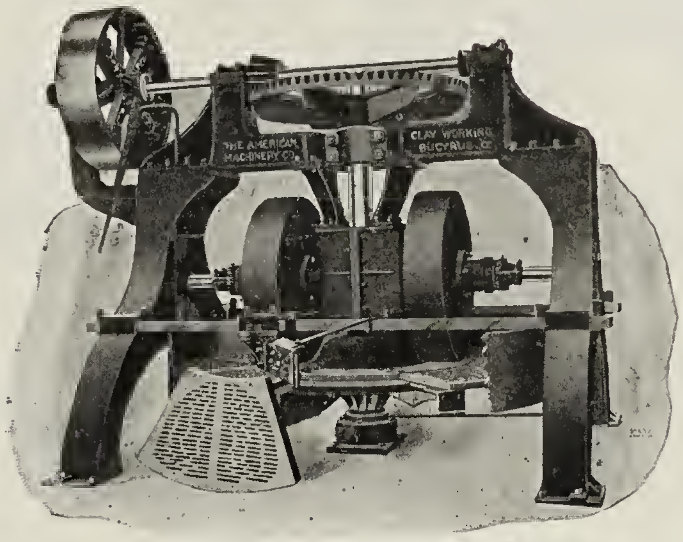

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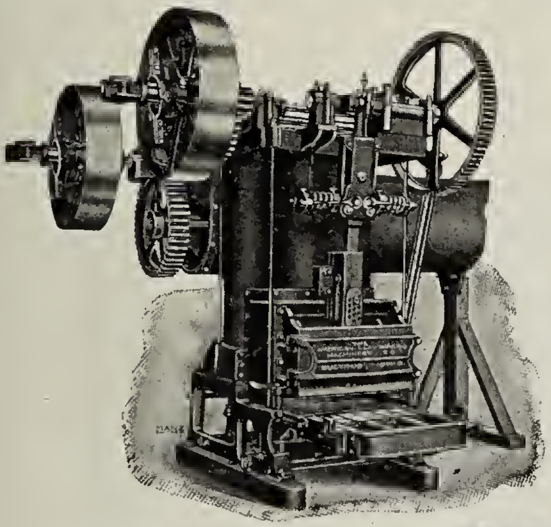

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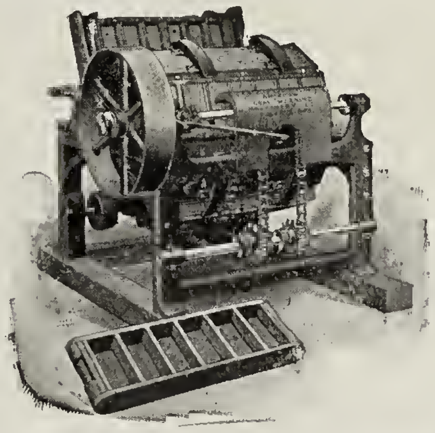

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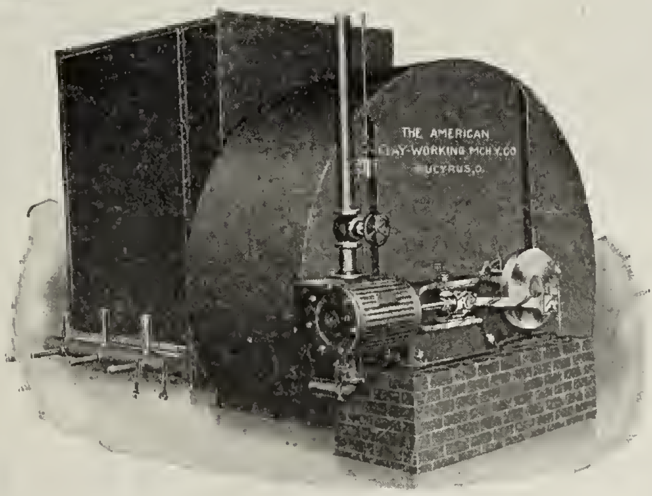

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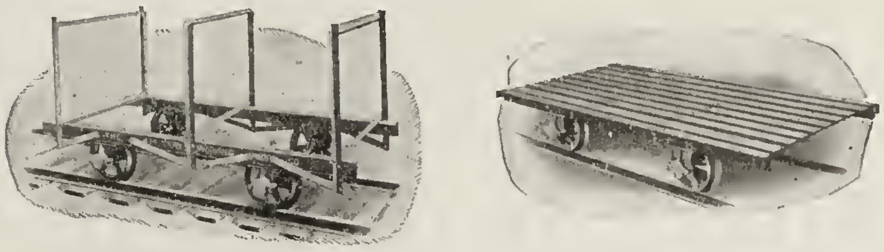

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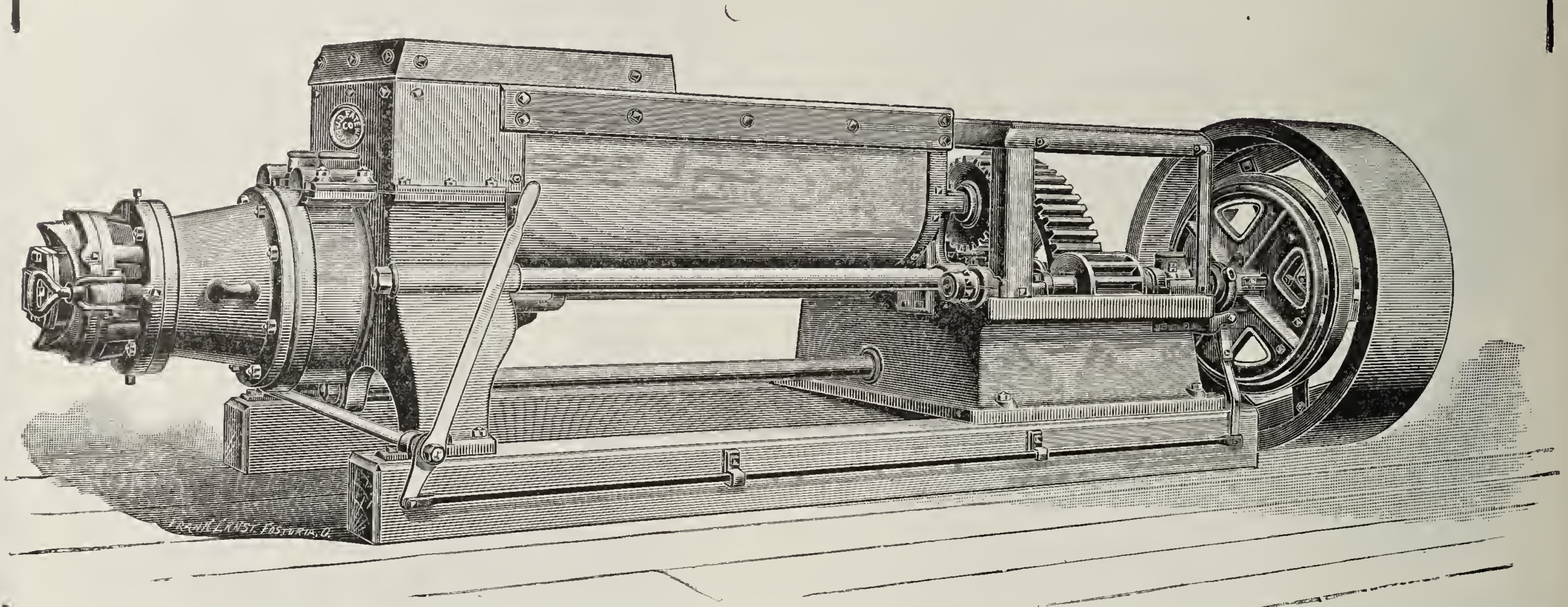
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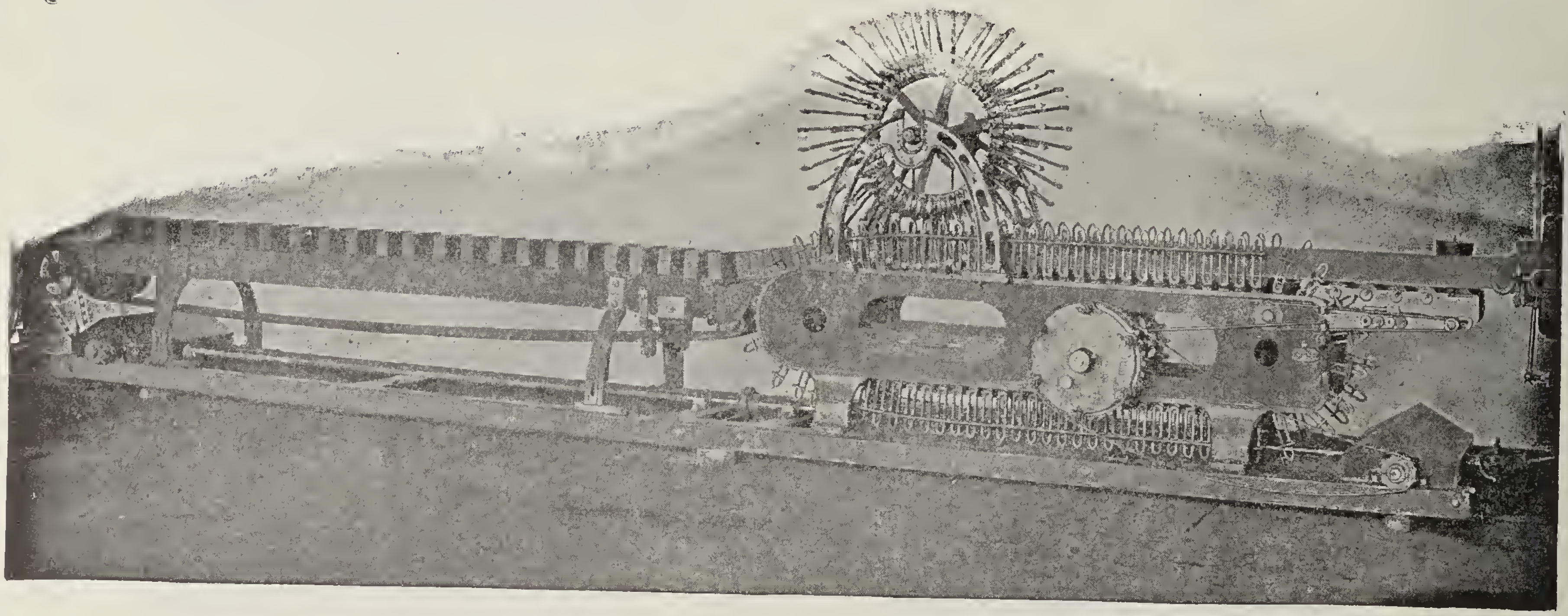

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CLAY RECORD

Vol. XXVI. No. 9. CHICAGO, MAY 15, 1905. Semi-Monthly, $1.00 per Year
Single Copies, - 10 Cents

REPORT OF TESTS MADE ON THE WISCONSIN CLAYS AND CLAY PRODUCTS BY THE WISCONSIN GEOLOGICAL SURVEY.

BY PROF. HEINRICH RIES, CORNELL UNIVERSITY, ITHACA, N. Y.

Some years ago the Wisconsin Geological and Natural History Survey began an investigation of the clay deposits of this state. This work was under the charge of Dr. Buckley, who made a somewhat detailed study of the distribution of the clay deposits of the state, their geological relations, and chemical composition, and the results of his work were published in a preliminary bulletin of the Survey. It became necessary to abandon the work for a time, but last year opportunity was afforded to take the work up again, and the writer was placed in charge with instructions to push it to completion.

This recent work comprised (1) an investigation of the physical properties of the Wisconsin clays, together with such additional chemical work as was necessary, and (2) an investigation of the structural clay products now being manufactured in the state.

For the physical study of the clays, samples were collected from both worked and unworked deposits in all parts of the state, and these taken to the laboratory for physical tests. This line of work, which included a determination of the air shrinkage, plasticity, tensile strength, color-burning qualities, fire shrinkage at different temperatures, fusion points, etc., of the clays, was for a twofold purpose. In the case of worked deposits it was to determine, if possible, whether the use of more or less heat than is now being used would produce different results, or whether the clays could possibly be employed for other purposes than those for which they are now being utilized. In the case of unworked deposits, the aim was to find out if possible what application they might have.

The investigation of the bricks manufactured in Wisconsin consisted in determining their crushing strength, transverse strength and absorption, and has been productive of interesting results, as was to be expected.

Common brick form at the present time the main clay product of Wisconsin, while pressed brick, drain tile and common red earthenware are made to a small extent. Paving brick, stoneware, and firebrick are not manufactured at all. Several questions, therefore, arise.

Cannot pressed brick be made at other localities than those at which they are now being manufactured?

Are there clays in Wisconsin adapted to the manufacture of paving brick, stoneware or fire brick?

It was with the hope of being able to answer some or all these, that the present investigation of the Wisconsin clays was undertaken.

The clays of Wisconsin, considering their structure as it is seen in the field, fall into two groups. These are:

1. Residual clays, which have been formed by the decay of the rocks, and are found overlying the solid rock from which they have been derived. They show a variable thickness, depending on the depth to which the rock has decayed, and are not infrequently gritty, either because the rock has not been fully decayed or because it contains hard resistant minerals such as quartz, which does not disintegrate readily. In places they are covered with a capping of sandstone.

2. Clays which are more or less distinctly stratified and in most cases represent sediments that have accumulated under water. These form nine-tenths of the clay deposits found in Wisconsin, and they are often of great extent and thickness.

Physical Characteristics of the Wisconsin Clays.

The Wisconsin clays can be divided into two large groups, and one small one, according to their color-burning qualities, viz.:

1. Buff, or cream-burning clays (sometimes such a light cream as to be termed white).
2. Red or brown-burning clays.
3. White-burning clays.

The Cream-Burning Clays.—These occupy a large area in the eastern and southeastern portion of the state, and a small area in the northwestern part. Outside of this area there are scattered occurrences.

Samples of these were collected for testing from between 50 and 60 localities, and a comparison of them shows that they agree closely in certain characters, but differ in others.

They agree more or less closely in their color-burning qualities, some burning to a lighter cream and others a darker cream. They all show a low shrinkage until burned nearly to their point of vitrification, when the shrinkage suddenly increases from 1 per cent or less up to 7 or even 12 per cent, and from this point they change rapidly to a viscous condition. This rapid softening of the clay is one thing which would interfere with the use of these clays for the manufacture of vitrified brick. All the clays of this group burn to a rather porous body, due partly to the fact that they contain a high precentage of carbonate of lime, which, in burning, loses its carbon dioxide, leaving the brick quite porous up to the vitrifying point. Most of them burn to a good brick.

Here, however, the similarity between the different clays of this class ends. They show considerable variation in the temperature at which they become steel hard, some burning steel hard at as low a cone as .05, while others do not reach this degree of hardness until cone 1 or even 3. A similar variation is shown in their melting points. Among the most easily fusible were some from Green Bay, Burlington and Granville, which showed signs of viscosity at cone 1, while others, like those from Milwaukee, Whitewater, Kewanee, Madison, etc., became viscous at cone 5 or higher. The reason for this difference in their fusion points is to be found on comparing their composition, the more easily fusible ones containing a higher percentage of fluxing impurities.

In the cases of those clays having the higher fusion point, it was necessary to burn the bricks to a correspondingly higher temperature to obtain a sufficiently hard product. The effect of this difference is seen in the amount of heat required for burning the bricks.

Cones distributed among the manufacturers showed that the temperature at which the cream bricks were burned ranged from cone .05 to cone 3, the latter cone being used in burning bricks at Milwaukee, the former at Burlington.

An interesting feature in this connection is that even in the same bank the clay in different layers may show a difference in fusibility. At Burlington the yellow top clay becomes viscous at cone 5, while the lower blue clay reaches the same condition at cone 1. This is evidently due to the higher percentage of fluxing impurities.

Uses of the Calcareous Clays.—The main use of these clays is, and probably will continue to be, for the manufacture of common brick, but many of them lend themselves to the manufacture of dry pressed brick, and the tests made on them show them to be of fair strength. In addition, the smoother ones also work for the manufacture of drain tile. There is no hope of their being used for paving brick manufacture. On account of their high plasticity it is possible to utilize them in pottery manufacture, either for making flower pots, or for art pottery. Experiments made on some show that they could be molded either by turning on a wheel or by casting. They can also be used to mix with denser burning and more refractory clays, and in either case can be glazed.

Red and Brown-Burning Clays.—These, while not as widely distributed, represent probably fully as important a group of Wisconsin clays as the cream-burning ones. Roughly speaking, we may say that their distribution covers the western, central and much of the northern portion of the state, but the deposits are not always as thick or as extensive as those of the cream-burning clays, to the east and northeast they overlap the area of cream-burning clays, and scattered deposits also occur within the area of cream-burning clays, as at Green Bay. They can be grouped in several different classes, which had best be discussed separately. These are:

1. The residual clays of Central Wisconsin.
2. The red-burning shales of Lafayette and Grant counties, which, up to the present time, have received no recognition.
3. Red, stratified surface clays of varied origin.

The Residual Clays.—These appear to me to represent a clay resource not yet thoroughly investigated. They underlie an irregular belt in Marathon, Portage, Wood, Jackson, Eau Claire, and Vaughan counties, but are now worked only at Stevens Point, Grand Rapids, Ringle, and Black River Falls. At all these localities except the last-mentioned, it is the more gritty phases that are used, but not the most gritty ones found in his area, for we find that the clays range from very sandy ones, having many coarse, angular sand grains, to others which are quite fine and free from grit. Now, while the gritty phases may burn to a good red color, and they often do, it is impossible to make them burn to a good, dense, vitrified body, no matter how much they are fired, because there are not enough fine clayey particles in the material to thoroughly fill up the spaces between the sand grains. I do not wish to be understood as saying that I consider them fire clays, because they are not, for many of them fuse at cone 1. On the other hand, there are clays in this residual area which do burn to a pretty dense body and which, it seems to me, are worth experimenting with for the manufacture of paving brick.

As an example of the extremes in variation that we get, we may take three clays, two or them from Stevens Point, and the third from near Pittsville. Their fire shrinkage and absorption at different cones are as follows:

	Stevens Point,		Stevens Point. Brick Yard.		Pittsville.	
	Fire shr.	Absorption.	Fire shr.	Absorption.	Fire shr.	Absorption.
Cone 010........	.4	17.60	.6	14.30	2.3	11.32
Cone 05..........	.4	15.64	2.0	12.60	4.7	6.22
Cone 1...........	3.3	8.02	5.7	4.29	7.	2.27

The clay from Pittsville is one of the most dense-burning found in the residual area. It also burns to a good color. Among the localities where residual clays occur but are not worked may be mentioned Pittsville and Milladore. Again, east of Eau Claire, along the Eau Claire river, are additional exposures of residual clays, but only one sample of those tested was found to approach a paving brick body.

While the results thus far obtained are promising, they are not to be taken as final, and should be supplemented by tests on a larger scale.

Two facts should be borne in mind in this connection:

1. That careful prospecting is necessary, since the residual clays vary in their character from point to point, and neighboring farms, or even neighboring fields, may be underlain by clays which are quite different in their properties.
2. The residual clays can be economically worked only at those localities where there is no covering of sandstone, for the latter, on account of its loose character, is so unstable as to make underground mining methods too costly, and it is too thick to be stripped off.

Kaolins in Residual Area.—Rumors have been circulated from time to time regarding the existence of kaolin deposits in the residual clay belt, and during the course of our field work every effort was made to find such deposits if they existed. Only two were heard of. One of these was a pit near South Centralia, which was worked a number of years ago for fire clay to supply foundries, and is now exhausted.

A second locality lies about 6 miles east of Eau Claire, where in an artificial cut a vein of whitish clay about 6 ft. wide was seen. Samples taken from this vein show that it is not white-burning even at low temperature, but fires to a grayish-brown body. However, it is more refractory than any of the other residual clays tested. The deposit is too small, unfortunately, to be of any economic value.

Slip Clays.—Some of the clays found in the residual area are not only fine-grained, but also easily fusible, on account of the high percentage of fluxing elements which they contain, and the possibility, therefore, suggests itself of using these clays for slips. One sample of this sort tested was from a deposit out-cropping along the Wisconsin River, about four miles due southwest of Medford. The locality is well-known in that vicinity on account of the fact that excavations were made there some years ago in search for iron ore. It was found that if this clay be ground up and mixed with water and applied as a thin slip to a terra cotta body, it burns to a reddish and somewhat glossy coat at cone 1. This, therefore, suggests another possible use for some of these residual clays in the state of Wisconsin. I shall return to this subject of slip clays again.

Red-Burning Shales of Lafayette and Grant Counties.—In the southwestern part of the state in the region known as the Mound area there is an extensive deposit of grayish shale which in its upper part has weathered to a tough, plastic, yellowish clay. Although this material does not outcrop at any point still at many localities it is but a very few feet below the surface, being at most covered by a comparatively thin layer of sandy surface clay which covers most of that region. The best means of finding this deposit is to excavate in the land immediately around the base of the limestone mounds which are so prominent in the vicinity of Platteville. The clay is so near to the surface that it is sometimes thrown out in digging shallow wells. A sample of this material taken from the farm of Mr. Knebel, east of the Little Mound, gave the following results in burning:

Cone.	Fire shrinkage.	Absorption.	Color.
010	.6	14.78	Red
08	2.	9.49	"
05	1.7	5.11	"
03	4.	.50	"
1	vis		

This is one of the best red-burning brick clays found in the entire state and as low a cone as 08 gives a brilliant red color, and makes a good, hard brick. It was hoped that when first discovered, it would prove to be a paving-brick clay, but it softens too rapidly in firing for this purpose. There is no reason, however, why it should not be used for the manufacture of pressed brick, drain tile, and common pottery, or perhaps even fireproofing. It was found that mixing it with the surface clays of that region made it burn to a more open body without affecting the fire shrinkage to any appreciable extent. This same formation extends across the border into Illinois, and also into Iowa, and in the latter state it has been successfully used for some time for making an excellent grade of hard brick and drain tile, but it has not been found adapted in that state, either, for the manufacture of paving brick.

3. Red or Brown-Burning Surface Clays of Varied Origin.—Scattered over the central and western parts of the state are many deposits of red or brown-burning surface clays which are used chiefly for the manufacture of common building brick. One variety is that known as the loess, which is a moderately fine-grained, gritty clay covering wide areas but rarely having a depth of more than 5 or 6 ft. This, at the present time, is being used at Menomonie for the manufacture of dry press brick. There are, however, other localities in the western part of the state where this material occurs and where it could probably be used with equal success for the manufacture of clay products. It burns to a good, hard brick, of usually excellent color.

Surface clays of excellent color-burning qualities are also found at other localities. Among these may be mentioned Beaver Dam, Horicon, Milton, Reedsburg, Ellsworth, etc. At most of the localities where this type of clay is used, it is burned at such a low heat (below cone 010), as not to develop a body of sufficient hardness, and firing it two or three cones higher would give far better results.

White-burning Clays.—Deposits of a white-burning clay have, in the past, been worked in the region north of Hersey, the clay being stratified, of a whitish color, and containing more or less sand, from which it had to be freed by washing. The washed product has been sold chiefly for use in paper manufacture. The washing plants which were at one time built in that region have been dismantled and pits washed in so that no information could be obtained as to the character of the clay. In case, however, new deposits are discovered in this region it will be of interest and value to know that the tests which have been made on the washed clay from this locality show that it could be manufactured into earthenware without the need of adding any additional material, except flint and spar, for the clay is sufficiently plastic to require no ball clay.

Slip Clays.—The occurrence of slip clays has already been referred to in the residual area, but in addition to these several other localities were noticed at which easily fusible clays were found. For instance, at Sheboygan, a layer of reddish, easily fusible clay is found on top of the cream-burning clays. This, when ground up and applied to the surface of a terra cotta body as a thin coat, will at cone 1 give a light reddish-brown slip. Again, in the vicinity of Platteville certain beds of clay associated with the zinc ore deposits are also found to be of easily fusible character, and probably adapted to the manufacture of slip. One bed of this type is found immediately underlying the oil rock in the bottom of the tunnel of the Capitola Mine, southwest of Platteville, Its low fusibility is due to the remarkably high percentage of alkalies which it contains.

Fire Clays.—No deposits of highly refractory or true fire clay has been found in the state. The two most refractory ones tested were from a deposit on the hill top east of the Durand brick yard, which at cone 5 is not fused, although it shows signs of incipient fusion, and the other is the small bed of whitish clay mentioned from the artificial cut east of Eau Claire. Certain clays dug in the central residual belt are termed fire clays, but are not such by any means. The white-burning clays around Hersey contain too much grit to be highly refractory.

Distribution of Cones.—During the course of the field work, a number of sets of Seger cones were distributed among the manufacturers, in order to determine if possible at what heat their clays were being fired, the series distributed including cones 010, 08, 05, 03 and 1. The results obtained indicated that it would perhaps have been better to make up a set containing numbers above and below these. Some sets were returned without a single cone of the series being affected, while a few manufacturers returned every one in a thoroughly fused condition.

Considering the whole series, one important difference was noticeable. The cream-burning clays are almost invariably burned at a higher cone than the red-burning ones. This is due to the fact that they will not produce a sufficiently hard body as easily as the red clays do. The red brick manufacturers in most instances do not burn their bricks sufficiently hard, and slightly higher firing would often greatly increase their strength.

Tests of Wisconsin Bricks.—Ten samples of normally burned brick were selected from the kiln or stock pile at each plant visited, and these were shipped to the Engineering Laboratory of the University of Wisconsin, at Madison, for testing.

Five bricks were tested for their transverse strength, five for crushing strength and two for absorption. The transverse strength test was made by supporting the brick on two edges placed one inch from each end of the brick, while pressure was applied from above by a third edge, at a point midway between the two supports. The number of pounds was noted which was required to break the brick, and from this the modulus of rupture was figured.

The half-bricks from this test were used for the crushing test. For this the bricks were placed between the two plates of the testing machine, and pressure applied until the brick gave way. Since the bricks rarely had smooth surfaces, it was necessary to true them up with plaster of paris.

Of these two tests the transverse test is the most important. A brick set in a wall is never subjected to sufficient weight to crush it, but when the walls of a building settle, a strain is often put on the bricks which is greater than they are able to endure, and they consequently break in two.

The absorption test was made on half-brick, which were carefully dried, weighed, soaked for 48 hours in water and weighed again, the increase of weight showing the amount of water absorbed. The percentage of absorption was calculated in terms of the original or the dry weight.

Objections have been urged by some to this method of determining the absorption of a brick, it being claimed that the pores of the brick do not become completely filled with liquid, and that a better way is to place the brick in a vacuum while it is immersed. In making such tests we should not forget that we are trying to duplicate as nearly as possible the conditions to which the bricks will be exposed when in actual use. Under such conditions a brick is not exposed to a vacuum, but absorbs moisture while exposed to ordinary atmospheric pressure, and consequently by the vacuum method we are obtaining results of comparatively little practical value.

A careful analysis of the results obtained yields many interesting facts.

Firstly, there is no direct relation between the crushing strength and transverse strength of the brick. Two bricks of high crushing strength, may show quite different transverse strengths, the one being low, the other high, or vice versa.

The crushing strength seems to be less influenced by irregularities in the structure of the brick than the transverse strength does. The presence of lumps of clay, or pebbles, will cause the brick to break at a much lower point than it ordinarily would. This can be avoided by proper preparation of the clay.

Comparing bricks from the same yard, we find that the harder burned ones show a higher transverse strength, crushing strength, and lower absorption, than the underburned. The cream-colored bricks, as a whole, show a higher crushing and transverse strength than the red ones. This is largely because the red ones are not burned hard enough.

These and other deductions to be made from the results obtained in the brick tests will be discussed in detail in the printed report to be issued by the Survey.

Work Remaining to Be Done.

The laboratory work on the clays and clay products is nearly completed, but one important phase of the investigation still remains to be done. As has already been stated, the laboratory investigation has shown several of the clays investigated to be of a very promising character. It is, therefore, proposed to collect some large samples of these and send to some brick works where they can be tested on a large scale. The products thus obtained will then also be tested.

LEASED BY UNITED STATES BRICK CO.

The Mt. Gretna Brick Company, operating a large plant at Mt. Gretna, Pa., has been leased by the United States Brick Company of Reading for a long term. The deal was consummated within the last few days.

The concern has been in successful operation for some years and was capitalized at $50,000. B. Dawson Coleman is the president of the Mt. Gretna company. The plant was devoted to the exclusive manufacture of face bricks. It will be operated regularly as in the past by the new management.

GLASS PAVING AND BUILDING BRICKS.

On April 15, 1904, the Department of State, at the request of the Secretary of Commerce and Labor, mailed a circular to the consular officers of the United States in Europe, instructing them to obtain information in regard to the manufacture of paving bricks from glass, the material used in the manufacture of such bricks, and their value for the purpose named; also, whether bricks of this character are utilized for building purposes, and if so, with what success.

The following reports are the replies to the circular, covering consular districts where the bricks are manufactured or in use. The replies for all other portions of Europe state that glass bricks are neither manufactured nor in use in the respective countries or consulates.

Catalogues and prospectuses which accompanied many of these reports are on file in the Bureau of Statistics, Department of Commerce and Labor, where they may be consulted by interested persons.

FRANCE.

Artificial stone made from glass is manufactured in France under the Garchey patents, which are owned by the "Societe Anonyme La Pierre de Verre Garchey," a limited liability corporation, with a capital of $115,800, formed in 1900 for a period of ninety-nine years from January 1 of that year. Its offices are at No. 4 Rue Charras, Paris. Patents for the Garchey process have been obtained in most of the countries of Europe and their colonies, and in North and South America.

The principal French companies which manufacture the Garchey artificial stone are the "Carmausienne," with head offices at Toulouse and works at Bousquet d'Orb, in the Department of Herault; "La Societe Parisienne d'Exploitation des Procedes Ceramiques Garchey," whose offices are at Lyon and whose factories are at Creil, Department of Oise; and Demi-Lune, near Lyon, Department of Rhone. The Garchey stone is also made in Spain, Germany, and Belgium.

Old glass obtained from broken bottles, window panes, etc., is used in the manufacture of products such as paving bricks, common tiles, etc., where uniformity of texture and color are not necessary. For the higher grades, glass is first made from sand of suitable quality, carbonate of lime, sulphate of soda, and potash, the proportion being about 5 of sand, 4 of lime, and 1 of alkali. After being cooled slightly the glass is granulated by being thrown into cold water. The granules are put into refractory molds and again heated to a temperature below complete fusion until they become plastic. The molds are then withdrawn from the furnace, placed under a hydraulic press, and subjected to a pressure necessary to form the plastic material into the desired shapes. After being trimmed the molds are passed through the cooling process in ovens specially constructed for the purpose.

In the two operations of heating and reheating the cost of coal necessary to obtain the required temperatures is one of the factors which tend to make the production of the Garchy stone expensive. I have been informed that the inventor has discovered another process for making the stone from glass in one heating, by which the cost is materially reduced.

The Garchey company in Paris claims that the cost of production under the old process varies from 86.85 cents to $1.06 the square meter (10.76 square feet), according to where it is manufactured, the cost of labor, the price of coal, etc., or an average of 96.5 cents per square meter. The company bases its claim upon the results which have been actually obtained in the Spainsh, Belgian, and French factories.

The Garchey stone is manufactured in a variety of forms for paving streets, sidewalks, and gutters and for the uses for which porcelain and other tiles are employed, as tiling the walls and floors of bathrooms, operating rooms in hospitals, waiting rooms and staircases of railroad stations, etc. As the Garchey stone has the chemical and physical qualities of glass it is not readily attacked by chemical products, so that it can be used in factories and laboratories where acids and other chemicals are employed, and being impermeable to moisture can be used in cellars and other places where there is much humidity. The stone is also molded in ornamental forms and can be made according to the drawings of architects and interior designers for decorative purposes in drawing-rooms, offices, etc. To my knowledge, the Garchey bricks are not used in the construction of buildings, owing, principally, to their cost in comparison with other materials.

In the manufacturers' catalogues many shapes and styles are illustrated. The following are the prices of tiles, bricks, etc., mostly used:

Plain, smooth, or fluted tiles, 7.87 inches square, or 13 inches square, about three-fourths of an inch thick, used for tiling the sides of kitchens, dining rooms, corridors, bathrooms, etc., or flagging sidewalks, stables, passages, etc., 19 cents per square foot.

Bricks, roughed or fluted, 5½ inches square, 1.57 inches thick, also 7.87 inches long, 3.54 inches wide, 1.79 inches thick, for paving purposes, 27 cents per square foot.

For borders of sidewalks, gutters, or for staircases: Step, fluted or roughened, 19.7 inches long, 6.3 inches wide, 21.2 cents each; riser, 19.7 inches long, 7.87 inches wide, 26 cents each; bottom of gutter, same dimensions, 28.95 cents each.

For a highly ornamented tile 19.7 inches long, 13 inches wide, 63.7 cents each.

The bricks, squares, and tiles, can be made in various colors—white, green, white and black, pink, yellow, etc.

For large orders, or to architects and dealers, the manufacturers allow a discount of from 20 to 25 per cent from the catalogue prices. The manufacturers claim that although the first cost of the Garchey products may be higher than other materials used for the same purpose, yet, owing to their wearing qualities, they are more economical.

The Garchey tiles are in use for tiling the walls, floors, and staircases in several of the stations of the Metropolitan Railway of Paris. In reference to the results obtained, one of the principal officers of the railway company writes me:

Owing to the extreme hardness of these tiles (Garchey), they are not easy to cut, so it is difficult to place them in position or to redress them when they are worn. The smooth tiles become slippery, but with those that are roughened satisfactory results have been obtained. Smooth tiles are used on Line No. 1 and rough tiles on Line No. 2, the usual dimensions being 7.87 inches square and about three-fourths of an inch thick. For walls, the Garchey tiles present an attractive appearance, and stand the wear and tear unusually well, but as the tiles can neither be cut nor drilled, except with great difficulty, it is not easy to hang pictures or advertisements. For the staircases it has been found that the tiles become polished rapidly, which makes them slippery when wet.

In several of the large cities of France experiments have been made with the bricks for paving purposes. At the present time the Rues Tronchet and Crimee in Paris are paved with the Garchey bricks. In reference to the experiment being made by the city of Paris, the chief of the highway department writes me as follows:

"The Societe de Pierre de Verre Garchey was authorized to make a trial of its paving bricks made from glass in the Rues Tronchet and Crimee. The foundation for the paving is composed of a layer of concrete 5.9 inches thick, made in the proportion of 551 pounds of cement, 17.7 cubic feet of sand, and 35.3 cubic feet of small stones, and a layer of Portland cement 0.4 inch thick. The bricks measure 7.87 inches long, 3.74 inches wide, and 1.78 inches thick. They were laid directly on the foundation in rows perpendicular to the border, with a space between them of 0.2 inch, the space being kept by a wooden template of that thickness. The mortar used was mixed in the proportion of 1,322.8 pounds of Portland cement to 35.3 cubic feet of sand. Four days after the paving was finished the streets were open to traffic.

Up to the present time the paving, without having given bad results, does not appear to be wearing as well as that made of natural stone. It has been noticed that alongside of the tramway rails the paving shows signs of deterioration. It is somewhat expensive to keep the streets in good repair. The thinness of the bricks renders them fragile, and being laid directly on a foundation of concrete they are more liable to break while their sonorousness is increased. It is probable, if the bricks were 4 inches thick and laid like the natural stone blocks on a foundation of sand, they would have given much better results. At the present time the city of Paris has no intention of substituting artificial paving blocks for those made of natural stone, nor in the future, unless it may be clearly demonstrated that it would be a decided economy to do so.

"To resume, the condition of the paving in the streets above mentioned is not such as to render it necessary to stop the experiment and remove the bricks, and it would be better to await the expiration of the three years, the period required for all similar trials, to determine the exact results."

In 1897, at the request of Mr. Garchey, the inventor of the process, tests of artificial stone, in comparison with other stones and materials, used in construction, were made in the laboratory of the National School of Roads and Bridges, at Paris. The main objects of the experiments were to determine the crushing strains the materials would bear and the effects of frost, concussion and wear and tear. The results of the tests may be summed up as follows:

1. The Garchey artificial stone resisted a pressure of 28,774 pounds per square inch, while granite only stood a pressure of 9,245 pounds per square inch.

2. Influence of frost: The Garchy stone was immersed in refrigerating mixtures by which a temperature of 20 degrees below zero C. was obtained without any damage to the stone. Afterwards it resisted a crushing pressure of 28,845 pounds per square inch.

3. Wear from friction: The friction was obtained by holding the material to be tested to the face of an emery wheel at a constant pressure of 3½ pounds per square inch, the wheel revolving at the rate of 1,777 feet in one minute. The Garchey stone was classed No. 15 in a list of 27 other materials which were subjected to the same test. The wear of the Garchey stone was 0.45 inch after 4,000 revolutions of the wheel.

4. Resistance to shock: It required on an average 22 blows of a pavior weighing 9¼ pounds falling a distance of 3.28 feet to break the Garchey stone, and 3 blows to make the first crack, while other materials ordinarily used for paving were broken in 19 blows.

The manufacture of bricks and tiles from glass in France cannot be said to have met with unqualified success. It is the opinion of several persons with whom I have conversed that this is due not to the industrial value of the products, but more to the fact that the process has not been sufficiently exploited.

A. M. THACKARA, *Consul.*

Havre, France, September 8, 1904.

"IS IT PRACTICABLE OR PROFITABLE TO DRAW HEAT FROM THE COOLING CHAMBERS OF A CONTINUOUS KILN FOR DRYING BRICK IN A TUNNEL DRYER?"*

P. L. YOUNGREN, MILWAUKEE, WIS.

The above question refers broadly to continuous kilns as a class, and cannot be given a satisfactory answer without some reference to the various styles of continuous kilns, particularly to the method of fuel application, as the practicability will depend largely upon the effect the practice will have upon the firing of the kiln, and the quality of the ware being burnt.

Quite early in the history of continuous kilns it was found that the watersmoking process could not be successfully accomplished by simply passing the products of combustion from the hot burning chambers ahead through the successive chambers of green brick, unless the bricks were always set perfectly dry. If not set dry, difficulties arose in the form of discoloration, crushed and crumbled brick, due to the condensation of the accumulated moisture upon reaching a new chamber of cool, damp brick. It was also noticed that a considerable portion of heat remained in the cooling chambers that was not taken up by the feed air passing into the burning chambers under normal conditions of drafts most suitable for the proper firing. The idea then presented itself to utilize the surplus hot air to relieve the stagnant conditions in the watersmoking chambers without carrying it through the burning chambers, and today nearly all continuous kilns are provided with a flue arrangement for carrying out these principles in some manner or other.

In some cases, the hot air, after being withdrawn from the cooling chamber into a main flue, is caused to re-enter the watersmoking chambers ahead of the fire and mingle with the direct draft, thus serving to increase its capacity for carrying moisture without danger of condensation. In other instances, it is used independently for the primary stages of watersmoking each chamber separately before subjecting it to the direct draft.

It will thus be seen that, with the general run of bricks as we get them from the dryers nowadays, there exists, within the kiln itself, a demand for a considerable portion of hot air besides that which passes directly into the burning chambers to support the combustion of the fuel there.

However, in the majority of kilns, it is perfectly practicable to create and store additional heat in the burned bricks for use in a tunnel dryer at the expense of additional fuel over and above the minimum required for the burning of the brick, and the question then resolves itself into determining the relative cost between this method of generating and transferring heat to the dryer and the cost of other sources of heat supply for similar purpose.

It would perhaps be proper to mention here that in some types of continuous kilns there is a very large amount of heat involuntarily left in the cooling brick that cannot be advantageously used within the kiln, and for which there must be found some other use in order to derive the benefit from the fuel consumed in creating it. This is particularly the case in kilns fired with side furnaces, thus permitting a portion of the draft to enter the burning chambers directly from the exterior instead of taking it all through the cooling chambers. It is self-evident that this surplus of hot air is accumulated at the expense of extra fuel in burning.

In the type of continuous kilns, known as the "Hoffmann Kilns," the opportunities for storing additional heat in the cooling chambers are not so favorable, because, in the first place, the additional firing on the brick after they are finished means a greater deposit of ash and clinker on them, and increases the liability of overburning in and around the fireholes; and, furthermore, the additional firing on the finished chambers would be extremely hard on the fireman, who has to put the coal in from the top of the kiln, because of the great amount of gas and heat rushing up every time a cover is raised from a feed-hole in that part of the kiln. Those who have had experience with this type of kiln will support the statement that the hotter the air can be supplied to the burning chambers, the better the results obtained, and that even under ordinary circumstances there is considerable back-firing required to prevent the cold air from creeping up along the bottom too close to the burning chambers.

In a gas-fired kiln, constructed with independent chambers for the combustion of gas, the opportunities for accumulation of additional heat in the cooling chambers are quite favorable, and the practice need not in any way interfere with the efficiency of the kiln. After a chamber has been finished, the gas supply is simply cut down so as to maintain a temperature somewhat less than the finishing heat, until the next chamber ahead is finished.

It will be borne in mind that the amount of air carried through the fire in a continuous kiln is generally so great that there is always sufficient oxygen present to support the combustion of the additional fuel, even if the firing is trebled, providing, of course, that the fuel is properly introduced.

Having thus shown the practicability of using a continuous kiln as a means of supplying heat for a tunnel dryer, we will now consider the economy of such practice.

There is scarcely any need to go into deep demonstrations to prove that pure hot air can be produced more economically in the continuous kiln than it is possible to produce it by the ordinary method of steam coils. In the kiln the fuel is burned under conditions that insure the development of its full heat energy, and as this heat is applied directly to the brick, which subsequently transfers every unit of it to the air until their temperature has been reduced to normal, the conversion of the original heat energy of the fuel into hot air is accomplished with the smallest proportion of loss.

With steam heating, on the other hand, the cycle of conversion is much more complete, and is attended with greater loss. In the first place, there is generally a loss from imperfect combustion in the fireplace under the boiler; secondly, the products of combustion generally carry one-half of the heat out through the smoke-stack. These two principal sources of loss aggregate probably from 50 to 75 per cent. of the original fuel value, depending upon the efficiency of the boiler plant.

The cost of installing the fan and necessary flues for conveying hot air from the kiln to the dryer will not exceed the installation of the steam pipes in the steam dryer, and the cost of maintenance will be less. The actual cost will, of course, depend somewhat on local conditions, the proximity of the dryer to the kiln, etc.

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*Read at the Birmingham meeting of the N. B. M. A.

THE MANUFACTURE OF FACE BRICK IN WISCONSIN.*

By O. Wilson, Menominee, Wis.

The manufacture of front brick, as everyone knows, requires the raw material or clay in sufficient quantities, and accessibility to transportation facilities after being manufactured.

Inasmuch as the general appearance of a building conveys to the naked eye the stability and character of an investment, it is usually desired, both on the part of the architects and owners, to get the best front brick that can be purchased for a certain price, enabling them to construct their building so as to come within their estimate, and it therefore behooves every manufacturer of front brick to meet this demand by producing a good article at as low a cost per thousand as it is possible to do. In order to do this successfully, it is necessary to have the best equipment and machinery that money can buy. Careful attention to every detail is also very necessary. The clay must be carefully gathered and prepared, the brick must be made mechanically perfect and must be properly set and burned. After the brick have reached this point, there is another feature to be seriously considered, and this is one which, if neglected, will net a heavy loss to the manufacturer, and this is the sorting of the brick to a uniform shade. The company which I represent is a large manufacturer of front brick, and we have yet to find the burner who can burn a kiln of brick and have them all the same shade, although of practically the same color. Our front brick are sorted into eight distinct different shades, as well as a certain percentage of seconds and culls. This necessarily requires intelligent and experienced men to sort bricks out of different kilns of different burns to run strictly uniform in shade.

You will appreciate the fact that brick manufacturers are generally liable to neglect something in this, that or the other department for the sake of saving a few cents per day in a man's wages by putting a cheaper man in a certain department of the process of manufacture who has not the necessary experience, and, while he does the best he can, does not do as well as an experienced man whose services can oftentimes be secured, and the apparent saving is frequently an expensive one, for when the brick are ready for shipment instead of being front brick they are only fit for common work.

Architects and owners are becoming more and more rigid in their instructions to their superintendents of construction, both as regards material used and workmanship, and especially exacting on front bricks. When they pay the additional price for selected front brick and also an additional price for laying them, they have a perfect right to be more exacting and to expect better than common brick. Any person erecting a building of any kind, from a business block on the main street of the city to a warehouse on some back street or near the railroad yards, can much better afford to pay an extra price per thousand for what few brick are needed for the front of his building, which would probably amount to only a very few hundred dollars and thus increase the value of the building, in many cases, from $1,000 to $5,000 when thrown upon the market for sale.

Front brick that are made, set and burned in a first-class manner, if not sorted to run uniform in shade, fall far from being suitable for facing purposes and the extra care, expense, etc., in making front brick that demand a higher price than common brick is all for naught and comes out of the brick manufacturer's pocket, and if not realized at the time, it is to be presumed will be more emphatically impressed upon his mind when he closes his books for the year and finds his profits for front brick on the wrong side of the account.

GOOD ADVERTISING BRINGS RESULTS.

The Chicago Brick Machinery Company, 77 Jackson Boul., Chicago, are strong believers in advertising, and are always on the alert to get something up that is catchy and that will bring business. Every member of this well-known concern is of the same opinion regarding advertising.

"The King of Ireland."

St. Patrick's day they sent out to the trade the following three verses, accompanied with the illustration, that of John J. Moroney, the president of the company:

St. Patrick's Day in the Morning.

We Irish celebrate this Day,
St. Patrick drove the snakes away;
And many a worn out Brick Machine
Should share the fate the snakes have seen.

The Mick here shown goes through the land
With brand new outfits in his hand.
You'll also celebrate the day
You buy of him to work your clay.

Dry-Press, Wire-Cut, Sand-Mould Machines,
At prices right to suit your means.
All up-to-date, and bound to please,
You surely must need one of these.

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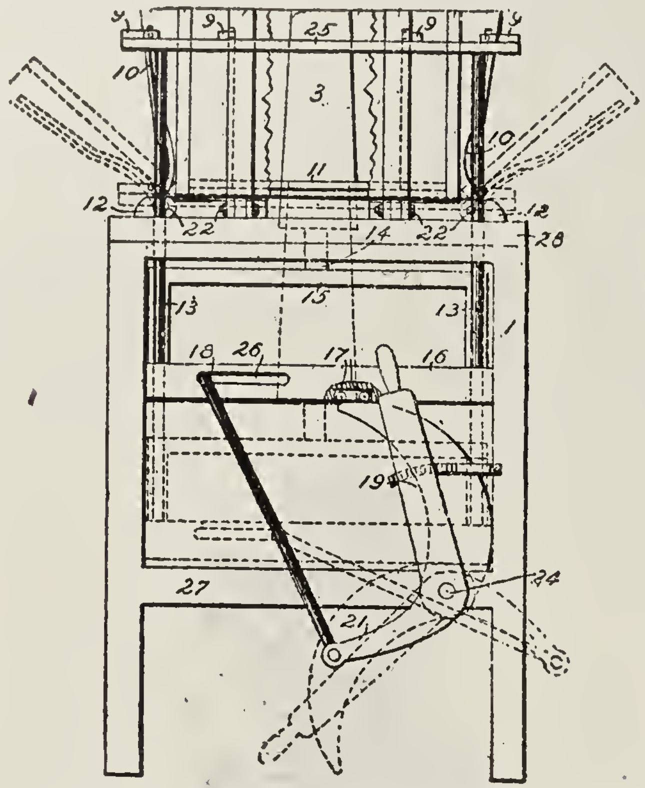
*Read at the Manitowoc meeting of the Wisconsin Clayworkers' Association.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

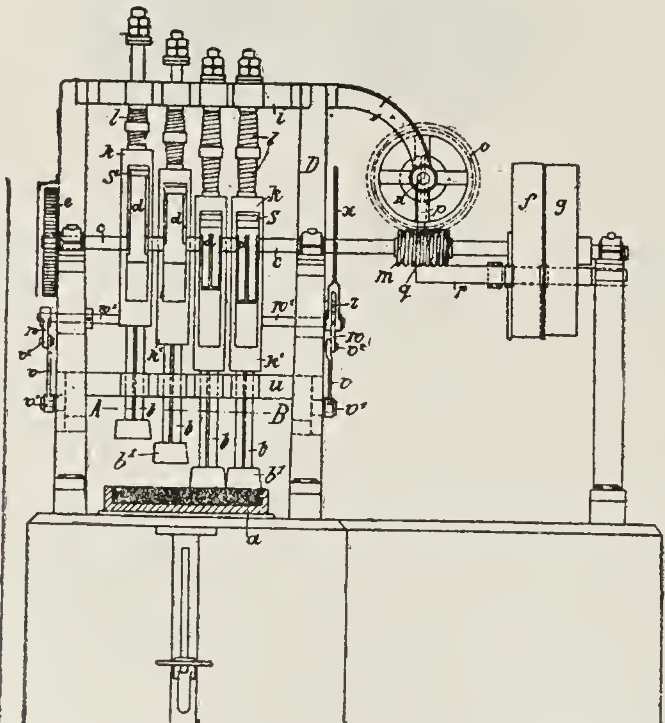
These new inventions are those that are especially of interest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

786,249. Machine for Forming Concrete Building Blocks. James F. Dunham, Waterloo, Iowa, assignor, by mesne assignments, to Waterloo Concrete Brick & Block Machine Company, Waterloo, Iowa. Filed July 21, 1904. Serial No. 217,454.



Claim.—A machine for forming concrete building-blocks, consisting of a mold having pivoted sides and ends, a removable bed-plate, grooved ribs on said side and end plates, a frame surrounding said mold, studs connected to said frame and adapted to move within the grooves on said ribs, and means for reciprocating said frame, substantially as described.

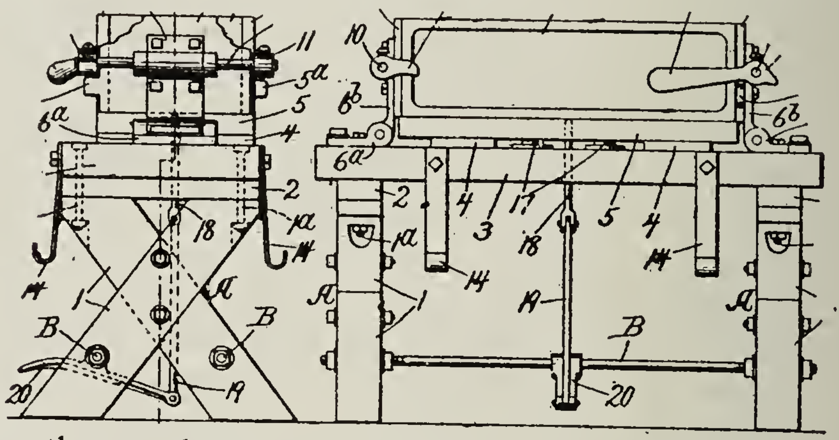
786,261. Machine for Making Artificial Stone. Florentius Brichta, Holzminden, Germany. Filed July 19, 1904. Serial No. 217,177.



Claim.—A machine for making artificial stone composed of a mold, a shaft, a series of fingers mounted thereon at different angles, plungers adapted to be engaged by the fingers, a slidable rail adapted to engage the plungers, and means for locking the rail in its raised position, substantially as specified.

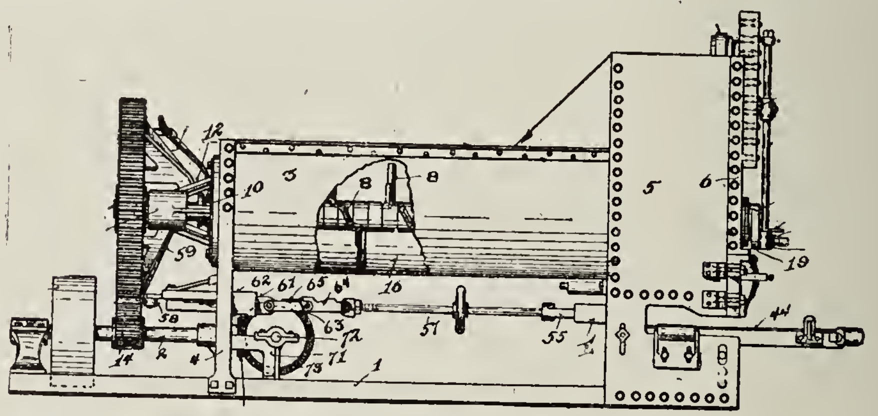
786,272. Machine for Molding Concrete Building-Blocks. Wallace L. Dow, Sioux Falls, S. D. Filed June 6, 1904. Serial No. 211,305.

Claim.—In a concrete-block-molding apparatus, in combination with a platform, a mold-bottom supported thereon; end gates hinged to the platform and removable side plates, the inner faces of the side plates and the vertical edges of the end gates having tongue-and-groove engagement with each other, and stops carried by the end gates which extend past the ends of the side plates and are movable to position at which they project over the outer face of the side plates opposite the ends of the end gates for locking said plates at their tongue-and-groove engagement with the end gates.



787,019. Brick-Machine. Daniel J. C. Arnold, New London, Ohio, assignor to The Arnold-Creager Company, New London, Ohio, a Corporation. Filed Sept. 23, 1904. Serial No. 225,560.

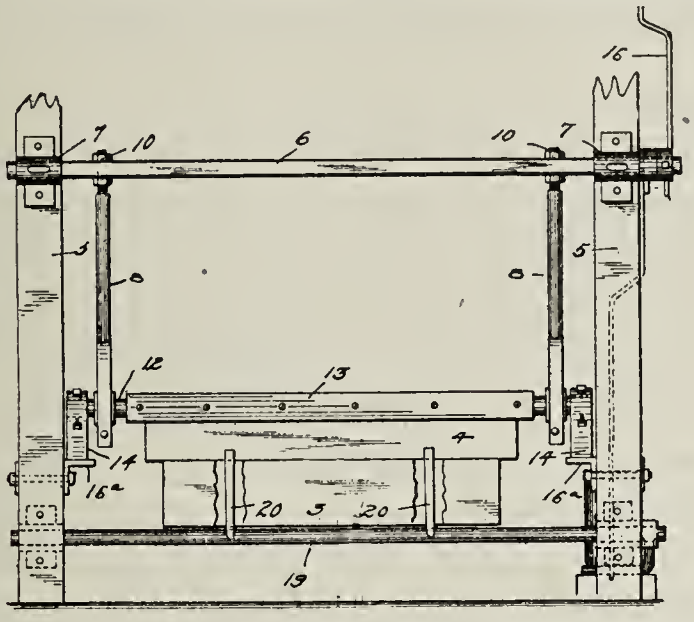
Claim.—In a brick-machine employing a horizontal pug-mill, a vertical charging-chamber, the pug-mill shaft extending through the charging-chamber, supported in a sleeve bearing in the front plate of the machine, an enlarged hub fixed to the end of said shaft journaling in said sleeve, a crank-pin mounted in said enlarged hub, a pitman journaling on and driven by said crank, a vertically-moving plunger mounted in ways supported on the frame, a stud-shaft connected to said plunger, projecting outwardly and forming a journal for the pitman, a second shaft connected to said plunger and projecting inwardly over the charging-chamber, a rod rigidly connected to the press-platen at the lower end, and supported on said inwardly-projecting shaft, whereby the said pitman drives the said plunger and platen rod vertically in unison, substantially as described.



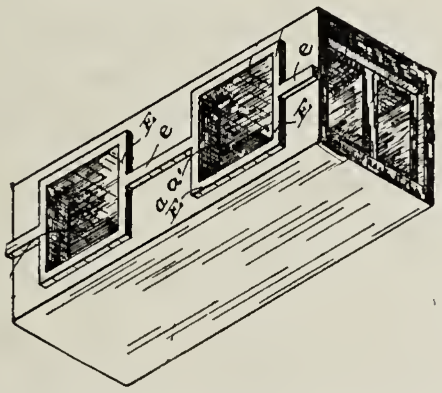
In combination with a vertically-charging press of a brick-machine, operated by the pug-mill shaft, the mechanism for reciprocating the mold-carriage, consisting of a main driving-gear on the pug-mill shaft, reverse driving-cams mounted on the rim of said gear, a connecting-rod fixed to the mold-carriage at the front end and slidably journaled in a support at the rear end thereof, a friction-roller journaled on the rear end of said connecting-rod, with its peripheral face athwart the paths of travel of the faces of the driving-cams, the parts being so disposed that both of said cams actuate the pitman-rod and molds positively in both directions, during part revolution of said main gear, substantially as described.

787,075. Attachment for Brick-Machines. William C. Burgum, Pittsburg, Pa., assignor of one-half to Harvey H. Francies, Pittsburg, Pa. Filed Aug. 19, 1904. Serial No. 221,394.

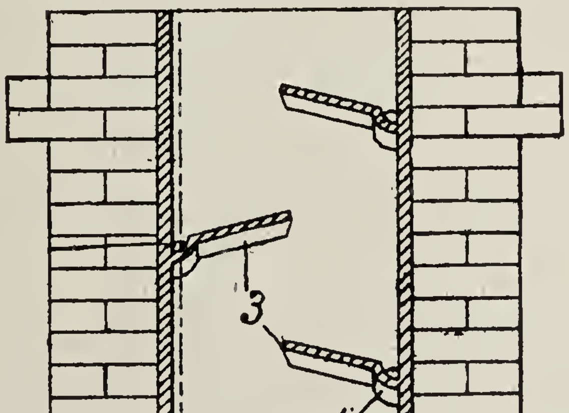
Claim.—In an attachment for brick-machines, the combination, with a mold, of means for removing the surplus material from the mold comprising a movable blade or knife arranged to be moved over the mold in two directions, means for supporting and moving the blade or knife, means for bringing the blade or knife into operative positions comprising a member carried with the blade or knife and a part located in the path of travel of the member, and means for maintaining the mold in position during the cutting operations, substantially as set forth.



786,884. Building-Block. William J. Faulkner, Chicago, Ill., assignor to Robert P. Faulkner, Chicago, Ill. Filed May 28, 1904. Serial No. 210,157.



Claim.—In a building-block comprising sides, ends and a top and bottom, the top and bottom, respectively, provided with appertures therethrough, a rib surrounding the apertures in the top and a rib surrounding the aperture in one end, and rabbets corresponding to such ribs, respectively, around the apertures in the bottom and around the aperture in the other end; substantially as described.

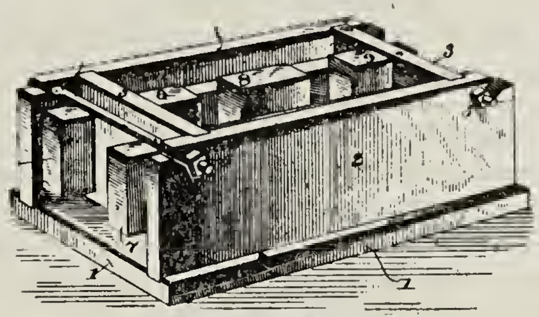


787,267. Chimney and Lining Therefor. James M. Bragg, East Hartford, Conn. Filed Dec. 12, 1904.

Claim.—In a chimney, including its flue, a shelf extending from side to side of the chimney and inclined downward widthwise of the shelf, and an opening through the wall of the chimney communicating with the trough formed at the junction of the shelf and inner wall of the chimney.

A chimney, including its flue, a plural number of shelves, each extending widthwise partially across the chimney and each inclined downward widthwise of the shelf, a trough formed at the lower edge of each of the shelves, and an opening through the side walls of the chimney communicating with said trough.

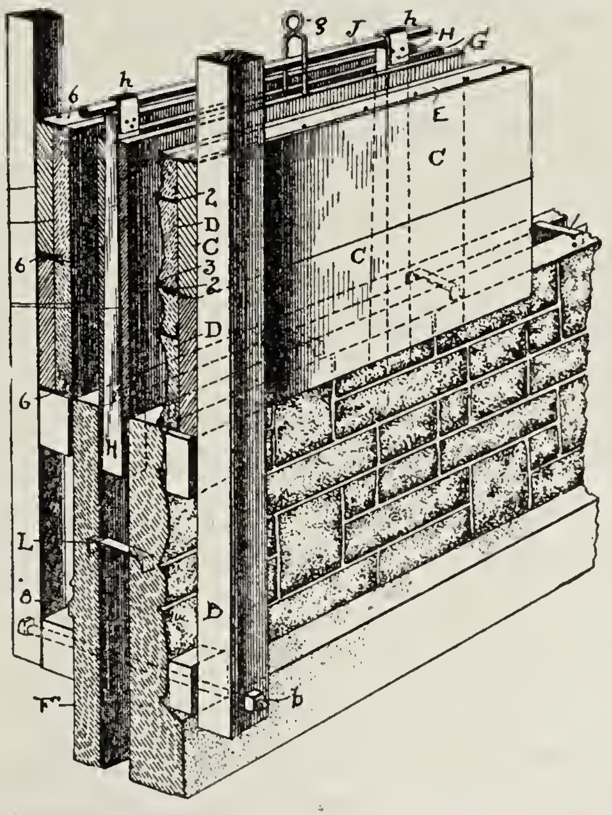
787,743. Mold for Forming Cement Building-Blocks. Billy Ely and James I. Taylor, Rock Rapids, Iowa. Filed Jan. 19, 1905. Serial No. 241,754.



Claim.—The improved knockdown mold for building-blocks, comprising a base, sides, and ends, the latter having openings, longitudinal bars or filling-pieces adapted to be inserted and supported in said openings and spaced from the top, bottom, and sides of the mold, and upright blocks secured to the base and spaced apart and from the filling-pieces in the longitudinal middle of the mold, the two end blocks being located close to the ends of the mold-box, substantially as described.

787,665. Building Concrete Walls. Reed Deeds and Wilbur C. Deeds, Cuyahoga Falls, Ohio. Filed Mar. 19, 1904. Serial No. 198,883.

Claim.—In the building of concrete and like walls, a temporary construction-wall comprising plain-surfaced supports, sheet-metal forms on the inner face of said supports and molds fixed in said forms, substantially as described.



In the construction of hollow building-walls, flat-sided outer construction-walls, forms fixed on the said walls and molds to give shape to the product confined in said forms, in combination with double-sided inner wedge-shaped construction-walls, wedges to spread said construction-walls laterally to the width of the hollow the wall is to have, and means to raise and support the said wedges in locking position, said means connected with the upper reduced ends of said wedges, substantially as described.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,
Ninth Floor, Plymouth Building,
303 Dearborn Street,
CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.
Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVI. MAY 15, 1905. No. 9

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

Pull never had a show as against brains.

While we should profit by the experience of others, we should try to be a little original ourselves.

Some men know nothing, and know it, and say nothing. Others know nothing and cannot keep from telling it.

The Clay Record is the only semi-monthly clay journal printed and costs one dollar per year. Can you afford to be without it?

You can't do anything with a string or a rope until the knots are all out. Life has many knotty places. Untangle them the first thing. Get a smile on your face, then all will go well.

Our readers were informed some time ago that an effort was being made to get the legislature to make an appropriation to secure the addition to the state university of a section for the study of Ceramics. We are happy now to be able to say that the last legislature authorized an appropriation amounting to $25,000.00 for this purpose; that it has been approved by the Governor, and thus becomes a fact that the University of Illinois has a section on Ceramics and that ere long workers in this industry will enjoy the fruits of researches along this line. It is something which should have been established long ago, and which might have been done had the clayworkers only appreciated the benefits it would bring to them and had worked together to secure it. It is never too late to do and get good, so we congratulate the clayworkers of Illinois on the establishment of this section.

It is a weakness in individuals and in aggregations of individuals to go to the extremes. How many good things have become failures on being carried too far; when those behind them, failing to observe the dividing line of the "happy medium," and keeping within which meant success, allowing them to travel beyond to ultimate failure.

We have in mind the tendency towards municipal ownership and operation of utilities. We are all agreed, save those who are fattening off the watered stocks and bonds, that certain public utilities should be owned and operated by the people or communities, but we do not at all agree that this principle should be carried to extremes and made to include everything, and do, most emphatically, draw the line at municipal ownership and operation of brickyards. We are impressed with the simultaneous, almost startling movement developed in recent weeks to establish municipal brick plants in many sections of the country. Two staple arguments have been used: To use up the shale found on town properties; the employment of criminals to keep them occupied, or from being idle, besides contributing to their maintenance during imprisonment.

In answer to these we have to say, briefly, this: If the town owns valuable properties containing shale, it should sell them to responsible parties who will agree to build and operate brick plants, thus adding new industries to the existing ones, besides adding to the revenues, population and to its prosperity. As regards the employment of criminals in competition with free labor, we very recently had something to say in these columns, which we need not repeat, more than to say we deny the right of municipalities to enter into competition with free labor in this manner or in this line of business, or, for that matter, in any line of business. But our main contention is that in exploiting such a scheme is to carry beyond the happy medium the principle of municipal ownership and operation. Besides, if communities are permitted to enter into making brick, why not into furnishing supplies of all kinds, such as meats, bread, garden truck; in short, all the food and clothing required by the people?

We might expand this argument indefinitely, but we think we have said enough, and more than enough, to convince the average reader that brickmaking is not one of the objects of municipal government and should be opposed and defeated wherever proposed.

OBITUARY.

A. Garrison Haven, a prominent business man and former brick manufacturer of Sangerfield, N. Y., died of heart trouble. He was 60 years old.

John Trombly, well known as a brick manufacturer and a resident of Wayne County, Mich., all his life, died at his home in Detroit. He was born in 1839.

Alexander H. Doty, who was formerly a prominent brick maker in Hartford and East Hartford, Ct., died at the home of his son, of uraemic poisoning. He was born in 1827.

S. H. Harbison, founder of the Harbison-Walker Fire Brick Co., of Pittsburg, Pa., is dead, after an illness of several years. He was chairman of the executive committee of the Harbison-Walker Refractory Co.

PAVING BRICK MANUFACTURERS FORM A NATIONAL ASSOCIATION.

About 40 delegates, representing seven-eighths of the $5,000,000 capital invested in the manufacture of vitrified paving brick in Ohio, Indiana and Illinois, met at the Grand Hotel, Cincinnati, Ohio, and temporarily organized under the name of the National Paving Brick Manufacturers' Association. Wm. P. Blair, of Terre Haute, was elected chairman, and Spencer M. Duty, of Cleveland, secretary. The three states represented manufacture more vitrified paving brick than all the other states combined, Ohio heading the list. A committee of five was appointed to draft by-laws and a constitution for a permanent organization to be presented at a meeting to be called by the committee the latter part of May and probably in this city. The manufacturers in states other than those represented in the temporary meeting held will be invited to participate in the next meeting.

"Speaking for the manufacturers present," said Secretary Duty, "we want it distinctly understood that this organization does not contemplate the control of prices in any way, but is for the improvement of the industry and to furnish information to individuals or municipalities, engineers and contractors concerned in laying streets with vitrified paving brick. We find that there is much need of this information. Nine-tenths of the streets of the city of Cleveland are laid with vitrified brick, the 22 manufacturers of easy access affording sharp competition and cheap material, which has demonstrated its merits."

INVENTED A NEW BRICK MACHINE.

A. Gillett, Woodhull, Ill., has invented a new brick machine that gives promise of being a winner in the world of burnt clay. It is a brick veneering machine by which a common clay brick can be given a repressed surface of any other kind of clay desired for exterior finish. By this process the cost of getting good building brick will be reduced about half or more. Mr. Gillett has applied for a patent on the new process and has great hopes of its usefulness.

ACCIDENTS, DAMAGES AND LOSSES.

A small cyclone struck the new buildings of the Northern Pressed Brick Co., at Crookston, Minn., and blew them down.

The Hartford (Ct.) Brick Company has been sold for $13,000 to satisfy a judgment of $11,727 in favor of a state bank.

John Schwarz, an employe of the Fremont (O.) Sand-Brick Company, lost the fingers of his left hand by getting them into the dry press.

Wm. H. Kirk was crushed to death and five others were internally injured by the falling in of a crown of a kiln at the Spars Brick Works, at Maysville, Ky.

Geo. H. Clippert has been appointed receiver for Dysanz, Stube & Haaz, brick manufacturers on Michigan avenue, Detroit, Mich., on petition of one member, Constance Haaz.

As a compensation for alleged injuries received by the falling of a scaffold, Samuel F. Grant, a laborer, has brought suit for $5,100 damages against the Ohio Pressed Brick Co., of Zanesville, Ohio.

The property of the Alabama Kaolin Co., Ft. Payne, Ala., has been sold by an order of the court to T. W. Spencer, of Boston, Mass., representing a majority of the bondholders. The price paid was $11,200.

The property of the Southwestern Brick & Tile Co., at Lake Charles, La., in which New Orleans people are the stockholders, was sold, piecemeal, at receivers' sale, many of the creditors being purchasers.

By the explosion of a brick kiln at La Prairie, Quebec, two men were instantly killed and one fatally injured. The dead are Joseph Forques and Joseph Dufort. Francis Chartrand will probably die. All leave families.

An explosion of an 80-h. p. boiler at the brick plant of McIntyre Bros., at Montgomery, Ala., killed Tom King, the negro fireman. The body was literally torn to pieces. The damage amounts to $7,000, covered by casualty insurance.

FIRE! FIRE!! FIRE!!!

The Tracey Brick Works, at Arcata, Cal., suffered a small loss by fire starting in the roof of one of the kilns.

Fire destroyed the brickmaking establishment of D. A. Layton, Marion, S. C., causing a loss of nearly $20,000. Insurance, $9,000.

Fire originated in the dryer of the plant of the Jackson (Mich.) Pressed Brick Co., destroying the elevator, chutes and sand bins, doing a damage of $2,000.

The machine shop and boiler house of the Burns-Russell Company, Baltimore, Md., brick makers, was destroyed by fire. The loss is several thousand dollars, but is fully covered by insurance.

A fire broke out in the John Mock Brick Works, at Muncie, Ind., and for a time threatened the whole plant. The fire department got the fire under control, causing only a small loss.

CELADON ROOFING TILE COMPANY TO ENLARGE ITS ALFRED PLANT.

The annual meeting of the Celadon Roofing Tile Company, Alfred, N. Y., elected the following officers: President, Will R. Clarke, New York City; vice-president, C. Layton Ford, Plainfield, N. J.; secretary, Mrs. Eugenia Babcock, Plainfield, N. J.; treasurer, E. S. Marvin, Brooklyn.

The company is in a flourishing condition, and plans are under way for the enlargement of the plant. An elevated carrier system is to be installed soon to carry the shale to the works, and the tile to the station, which will be a great convenience.

WHAT GENEVA (N. Y.) SAYS ABOUT BRICK PAVEMENTS.

The city of Wilkesbarre, Pa., is in the throes of a brick paving agitation. That city desires to build about seven miles of brick paving, having decided to discontinue the laying of asphalt streets. The city of Geneva has had occasion to do a great deal of experimenting in the street paving line, and, as brick pavements were laid in this city as long ago as 1890, it may interest our Pennsylvania friends to know something about what is considered the best brick in use here. In 1898 Genesee street was laid with Metropolitan, the famous Canton shale brick. This street was guaranteed for fifteen years. After five years, a small charge was made by the contractor for this guarantee; for the second five years a charge of two cents per yard was made, and for the third five years, three cents per yard was the bid price; making a total of five cents for the ten years, or one-half cent a yard per year. Last year the board of public works took up the question of the continued guarantee, and decided that there was no probability that the street would show any appreciable wear during the coming fifteen years. It was therefore decided to waive the guarantee. The board thereupon, by resolution, abandoned the fifteen year guarantee clause, although the cost would have been but one-half per cent a yard, per year.

Of the various brick pavements in use in Geneva, this street is undoubtedly the one that will live longest. In fact, some of our citizens say that it will last at least fifty years. The street extends from the business center to the Lehigh Valley Railroad depot, a distance of about three-fourths of a mile. Not only has it sustained loads of fifteen tons, but on two occasions the city steam roller, weighing sixteen tons, at Lewis and North streets, passed over it with spikes remaining in the big wheels, and no perceptible injury resulted.

"CON" MAN GETS TWO YEARS.

Thos. P. Keyes, the real estate broker who was charged with having sold stock in the St. Louis Cement Brick Company, which never existed, to Wm. Perry of Orion, Mich., who was induced to part with two certificates of deposit for $500 each and a promissory note for $500, has been found guilty of fraud at St. Louis, Mo., and sentenced to two years in the penitentiary.

RUNNING FACTORY NIGHT AND DAY MAKING BLOCK MACHINES.

The Cement Machinery Co., of Jackson, Mich., exclusive manufacturers of the Normandin concrete block machine and devices, are running their factory night and day to supply the demand for their machinery. We are advised that this company have just furnished and have completed shipping a large consignment of their latest style "C" machine, which has recently been placed on the market, to the United States Government, as well as large shipments to England and South Africa, within the last ten days.

This company is enlarging their factory, although they have a two-story building, with a frontage of 80 feet and 170 feet deep, to facilitate their manufacturing end of the business, as they are making arrangements to place upon the market one of the finest lines of hollow concrete block machines, including post machines and mixers as well, also sill and cap machines, and everything necessary for the contractor or engineer handling concrete blocks.

The government, at Fort McDowell, are constructing a barracks about 50 ft. x 300 ft. of concrete blocks made on the Normandin machine.

The Cement Machinery Co. is one of the most enterprising companies, as well as the largest manufacturing concrete block machinery in the United States. Thousands of blocks, the product of the Normandin machine, are being used daily in the construction of some of the largest hotels, factories, churches, residences and other buildings.

The United States Government have tested the Normandin blocks at their Arsenal at Watertown, Mass., for crushing and tensile strength. The Normandin block has also been in many fire tests and has proven to be superior on account of construction of the block; that is, that the air chambers are in proportion to their width.

The pattern department of the Cement Machinery Co. is equipped whereby it is in position to turn out the latest of designs, and the rock face designs used on the Normandin machine are worthy of special mention.

ASSOCIATION FORMED FOR THE PURPOSE OF BETTERING TRADE CONDITIONS.

The brick manufacturers of York, Pa., have organized the York Brick Manufacturers' Association for the purpose of bettering trade conditions.

One of the members of the association said that the brick business had been in a rather demoralized state for several years past, and claimed the manufacturers have not been able to realize a living profit on their product.

At a meeting of the manufacturers a scale of prices was fixed for brick for this year, which will be adhered to by every member of the association, as follows:

Run of kiln brick, $5 per thousand, cash, or $5.10 for credit; arch brick, $6 per thousand; line brick, $7 per thousand; paving brick, $7.50 per thousand.

The following firms are represented in the association: John Kissinger, Springarden Brick Company, C. E. Miller, William Grothe and Plonk & Stambaugh.

The officers of the association are John Kissinger, president, and Elmer Frey, secretary.

MOB SHUTS BRICKYARDS.

A mob of seven hundred Syrians, Italians, Hungarians and negroes, who had gone on a strike from the brickyards in and near Dutchess Junction, N. Y., marched to Chelsea, stopping on the way and compelling other workmen to quit the yards. At their head was a Syrian, carrying a pole flying a red handkerchief as a flag, and many of the strikers were armed with clubs.

For eight miles between Dutchess Junction and Chelsea they proceeded along the New York Central Railroad track, and when the march was completed had forced out all the employes of thirteen brickyards, including from 1,000 to 2,000 men. The only violence reported was in the case of one man whose hand was clubbed because he continued to work. The sheriff received no request for protection, and the mob was unmolested by the authorities.

The strike began at Dutchess Junction, when sixty Syrians quit at Budd's yard. They had been working fourteen hours a day for $2, and demanded more pay and shorter hours. There is great demand for brick, and laborers are hard to get this spring; therefore it is expected some concessions will be made to induce the strikers to return to work.

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BIG DEMAND FOR BRICK AT DES MOINES.

An unusual demand is now being made on the Des Moines brick concerns to supply building and paving brick for the work being done in Des Moines and vicinity this year. Most of the larger plants are working larger forces than ever before, and the total output for the year will exceed that of any other year by 25 per cent.

One of the well informed brick manufacturers of the city estimated the total output of the plants of the city this year at 70,000,000 brick. This is considered a conservative estimate. The larger per cent of these brick are already sold. This will be about 20,000,000 more than were turned out last year.

To meet this increased demand, larger forces of men are employed. There are now about 600 men working steadily throughout the year at the various brick yards of the city. The amount of wages paid will reach from $350,000 to $400,000, estimating an average monthly wage of $50, or $600 per year, which is the sum usually paid to the workmen in the brick plants. Some receive considerably more and others less, but the average will reach that sum.

The 70,000,000 brick to be sold this year will bring about $700,000, or three-quarters of a million. Prices range from $8 to $11 per 1,000 brick, the latter price being paid for the best paving brick and for some qualities of face brick.

To the brick industry more than any other one industry is credited the activity in the coal mines throughout the summer, for the brick plants consume about 110,000 tons of coal during the season. To the railroads, which are large consumers of coal, and the other factories of the city, is credited the balance of the coal trade during the summer months, for it is then that the general public buys no coal.

There are six large brick plants in the city. In reaching the total estimate of seventy millions, three of them were credited with an output of from twelve to fifteen million, two with about twelve million each, and one with five to six million. There are some small concerns for which no total estimate was made. However, this easily shows that the total will reach if not exceed seventy million.

FOUNDER OF THE HARBISON-WALKER FIRE-BRICK CONCERNS DEAD.

S. P. Harbison, founder of the Harbison-Walker Fire-brick Company of Pittsburg, Pa., died the 5th of May after an illness of several years' duration.

Mr. Harbison had not been actively engaged in business for the past ten years. He had been in delicate health and spent most of his time traveling in this country and Europe.

Mr. Harbison was chairman of the executive committee of the Harbison-Walker Refractory Company of Pittsburg, which controls thirty plants in Pennsylvania and with which the Portsmouth Harbison-Walker Company affiliated. All of the plants were idle during the funeral and the general office closed at noon. The deceased was a prominent Presbyterian.

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ILLINOIS BRICK CO. REDUCES STOCK.

The Illinois Brick Company's plan for reducing its capital stock has been ratified at a special meeting of the stockholders. There was represented in person and by proxy 98 per cent of the old capital stock outstanding. The following resolution was adopted:

"Resolved, That the capital stock of the Illinois Brick Company be and the same is hereby reduced from $9,000,000 (being $4,000,000 preferred and $5,000,000 common stock), to $4,000,000 of a new uniform issue of stock represented by 40,000 shares of $100 each."

All legal requirements have now been complied with, and the new stock will be delivered by the First Trust and Savings Bank upon surrender of its convertible receipts.

Those who were instrumental in bringing about the reduction in the company's capitalization are firm believers in the future of the concern. It is maintained that the company is in a position now to pay dividends at the rate of 8 per cent on the new stock. The last declaration was at the rate of 2 per cent for the quarterly period, and the large shareholders claim that will be the regular rate.

The company's earnings thus far this year have been large and the prospects are described by officials as being of a most promising character. Of course, the present year has been an exceptionally good one for new building. The brick business has participated to the fullest extent, and the Illinois company, being the main manufacturing concern of its kind in this vicinity, has shared conspicuously in the prosperity.

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STONE MAKING AND MAKING FACES.

The two above titles are of commercial booklets that are gotten up by the Pettyjohn Bros., of Terre Haute, Ind.

Stone making treats on the making of ordinary building blocks in a Pettyjohn machine; gives a word about cement, and a little reasoning regarding the manufacture; while Making Faces will show you how to make the high-class, ornamental face blocks. It shows each movement to be made from the placing of the mold in position to receive the material for this block to the lifting off of the mold from the finished block. Both pamphlets are of value to anyone contemplating going into the cement block business.

SAND OR LIME-BRICK OR BLOCK NEWS.

Wadena, Minn., will soon have a cement brick factory.

The Des Moines River Sand Co., Eddyville, Ia., have put in their plant a cement block equipment.

The Federal Granite Brick Co., Sevanton, Pa., has increased its capital stock from $25,000 to $100,000.

John Soderstrom, Sac City, Ia., has invented a cheap and efficient single brick machine for making cement brick.

The Mt. Gretna (Pa.) Brick Co. has leased its sand-lime brick plant to the United States Brick Co., of Reading, Pa.

Jansen & Zoeller, Pekin, Ill., have put in machinery for making concrete blocks, and already have three big contracts.

The North Star Concrete Company has been organized at Lake Crystal, Minn. Brick and concrete blocks will be turned out.

The Sharp Sand Brick Co., offices at Columbus, Ohio, and works at Sugar Grove, announce that their plant has been started.

John Jamison, Oelwein, Ia., is having sand tested with a view of putting in a sand-lime brick plant to make 20,000 brick per day.

Winburn F. Conrad, 3016 Clifton street, Indianapolis, Ind., has invented a machine to make cement brick at the rate of 6,000 per hour.

Hess Bros. Brick Works, Mendota, Ill., have added to their brick plant a cement block machine for making all kinds of building blocks.

J. H. Emery, of Bay City, Mich., has recently obtained a Canadian patent for his cement brick machine, and opened up a branch office at Windsor, Ontario.

A cement shingle factory is being built at Kenton, Ohio. A site was selected opposite the plant of the Kenton Gas Engine Co., on the tracks of the Big Four.

The Indianapolis (Ind.) Composite Brick Co. is being organized, with $60,000 capital stock. Lawrence Elkus is president, and the office is 906 State Life Bldg.

The Pettyjohn Company, Terra Haute, Ind., has purchased the building at 6th and Vandalia Ry., and will remodel it and manufacture concrete brick and tile.

The Houston (Texas) White Brick Co. has placed their plant in active work, making 40,000 brick daily. The plant was erected by the Steger Sand Lime Brick Co., of Bonham, of which Ed. D. Steger is the moving spirit.

The Newburgh (N. Y.) Brick Co. are now turning out sand-lime brick at the rate of 20,000 daily. Geo. R. Mitchell is president; James S. Taylor, vice-president; Wm. T. Hilton, treasurer, and W. J. McKay, secretary. The plant is in the town of New Windsor.

The German Arch Stone Brick Co., North and Centre streets, Baltimore, Md., a $100,000 company, has purchased 30 acres of land on Curtis Bay and will erect a sand-lime brick plant. The Semisteel Company, of Cleveland, Ohio, will furnish the machinery. John A. McAnulty is president; James T. Miller, vice-president, and Henry F. New, secretary and treasurer.

MISCELLANEOUS ITEMS.

The Dexter (Kan.) Vitrified Brick Co. has been incorporated with $25,000 capital stock.

Cooley Bros., Smith & Co., Marion, Va., are establishing a works with a daily capacity of 20,000 brick.

The Bradford (Pa.) Pressed Brick Co. are building five new kilns and adding another Boyd dry-press, which doubles the capacity of the plant.

The Atlas Bolt & Screw Co., Cleveland, Ohio, have opened up a Chicago office at 1532 Monadnock Block. William Pike is in charge.

A. J. Clark & Son, Bloomfield, Ia., have bought a lot of modern brick and tile machinery and have already got up a building in which to put it.

The Barboursville (Ky.) Brick & Tile Co. has been incorporated and machinery bought. The organizers are S. B. Dishman and J. H. McDermott.

The Hewitt Brick & Tile Co. has been incorporated with $50,000 capital stock at Colorado Springs, Colo., by John Oskison, Daniel Hewitt and J. J. Ramsey.

The Platt Patent Kiln Co., Van Meter, Ia., are making a special combination offer of their Patent-Triple down-draft kiln, with a McManigal Grateless Furnace.

The Bedfard-Oolite Brick & Tile Co., Bedford, Ind., has been incorporated with $10,000 capital stock. J. R. Henderson and Charles O. Lantz are interested.

The Peninsula Brick Co. has been incorporated at 322 Market St., Camdem, N. J., with $500,000 capital stock, by Howard C. Walton, Joseph Till and Samuel H. Howitz.

The Missouri Pressed Brick & Imp. Co., St. Louis, Mo., has been incorporated with $20,000 capital stock, by H. C. Konig, T. C. Eggers and E. C. Koenig, 708 Rialto Bldg.

The Alonzo Curtis Brick Co., Grant Park, Ill., are shipping ten carloads of brick daily to the Sears, Roebuck & Co. buildings in Chicago, who have placed an order for 40,000,000 brick.

The Winchester Rock & Brick Co. has been organized at Saco, Maine, with $500,000 capital stock. James H. Shedd, president, Arlington, Mass.; B. B. Shedd, treasurer, Waltham, Mass., and Geo. A. Emery, Saco, Me.

The Drymore System has moved from Chicago and are now at 811 Wainwright Bldg., St. Louis, Mo. J. J. Gledhill, who is well known to nearly all the clayworkers of this section of the country, is one of the representatives.

Peter English, 1st and Sherman avenues, Denver, Colo., while making excavations for a gas plant at Fort Collins, discovered a fine bed of clay for tile and brick and will organize a stock company, which he will be largely interested in, to develop the deposit.

Mr. A. R. Root of Chambers Brothers Company has been making a trip through Virginia and among other business secured an order for a 25,000 per day stiff mud outfit from Mr. Wm. Bernard of Fredericksburg, Va. The machinery has already been shipped and will soon be placed in operation.

Snowden & Williams, Winchester, Ky., have secured a site for a brick making plant.

Work has been resumed at the Catskill (N. Y.) Shale Brick Works, after a suspension of three years.

L. E. Roe, recently from Douglass, Wyoming, will begin the manufacture of brick at Thermopolis, Wyo., in a short time.

McKnight Bros., Humboldt, Tenn., have begun operating their steam brick factory, which has a daily capacity of 25,000 brick.

The Pikeville (Ky.) Brick Co. is having its yard put into shape so it can operate, rain or shine. They make 1,200,000 brick monthly.

Messrs. Stough, Wert and Wasser, of Ida Grove, Ia., have about concluded arrangements to locate a brick making plant at Fremont, Neb.

H. M. Deavitt, 140 Dearborn street, Chicago, is a practical and consulting clay chemist. He will analyze your clays, shales, sands or cement materials.

The Pioneer Brick & Construction Co., Denver, Colo., has been incorporated, with $10,000 capital stock, by Edward Kress, J. Kress and H. W. Rover.

The Gettysburg (Pa.) Brick Co. have decided to add crushers, a larger engine and to build five or six more kilns, so as to increase the capacity of the plant.

The Hamburg (Pa.) Vitrified Brick Co. have received a contract to furnish 5,000,000 brick for the Pennsylvania Ry. tunnel under the East River, at New York City.

The Tuna Valley Pressed Brick Co., Bradford, Pa., has closed a contract for 3,350,000 pressed brick for New York. The company will double the capacity of its plant at once.

The Ohio River Brick Co., Ripley, Ohio, has been incorporated, with $10,000 capital stock, by J. C. Shumaker, Eliza B. Clinger, W. H. Wilson, Henry Sacker and E. T. Kirker.

The Macon (Ga.) Brick Co. has been incorporated, with $3,000 capital stock, with privilege to increase to $25,000. The incorporators are W. C. Turpin, R. W. Crockett and R. H. Powell.

The United States Brick & Fertilizer Co., Cleveland, Ohio, has been incorporated, with $25,000 capital stock, by Solomon Blair, Jr., O. L. Motts, H. E. Motts, O. H. Motts and W. R. Seeley.

The McArthur (Ohio) Brick Co. has been incorporated, with $75,000 capital stock, by L. M. Sprague, D. McKeever, Aaron Will, Jr., O. F. Pilcher, H. S. Hamilton, J. R. Freiner, O. E. Vollenweider and D. A. Martindill.

C. B. French, of the Jamieson-French Fire Clay Co., St. Louis, Mo., has retired from the above firm, selling his interests to Henry K. Lackland, who is now the treasurer and general manager, and control of the entire business.

Lewis Brower has sold his interest in the East Windsor Hill (Ct.) Brickyard to M. Lahy, of Newburg, N. Y., and has bought the brick-making plant of Henry D. Alden at Thompsonville. John Best, of Albany, will be associated with Mr. Brower in business.

Ben Schier, West Point, Ia., has bought land and is building a brick and tile plant.

O. W. Burns, of St. Cloud, Minn., is expecting to locate a brick yard at Richville, N. Dak.

The Croswell (Mich.) Brick Co., Ltd., has been incorporated, with $10,000 capital stock.

The Iowa Brick Co., Des Moines, Ia., has borrowed on its plant $60,000, with which to improve and enlarge the property.

Pittsburg and McKeesport, Pa., capitalists are negotiating for flint, clay and coal lands 2½ miles north of Lisbon, O., on the Erie Ry.

The Teoloyucan (Mexico) Brick Co. are now finishing a continuous kiln with 30,000 brick daily capacity, double the size of their present continuous kiln.

The Sturgis (Ky.) Brick & Tile Co. has been organized with J. L. Frankel president, Geo. S. Wilson vice-president, and J. V. King, secretary and treasurer.

J. G. Cole, J. S. Wilson, W. J. Green, J. A. Carpenter and C. W. Crum, Ferris, Texas, have organized a $24,000 stock company to establish a brick works.

Plans are now being drawn for the new building and the reconstruction of the D. Culbertson Stoneware Factory, at Whitehall, Ill. New machinery will be introduced.

John McDaniels and A. M. Martin, of the Independent Coal, Clay & Shale Co., of Girard, Ill., have leased land and will erect a tile, brick and pottery plant at Delhi, Ill.

The Coon Creek Coal Co., Clinton, Mo., has increased its capital stock from $50,000 to $100,000, and will build a vitrified brick plant. D. J. Haugeberg is the manager.

The Marion Brick Works, Chicago, Ill., works at Marion and Montezuma, Ind., have increased their capital stock from $250,000 to $300,000, and directors from three to five.

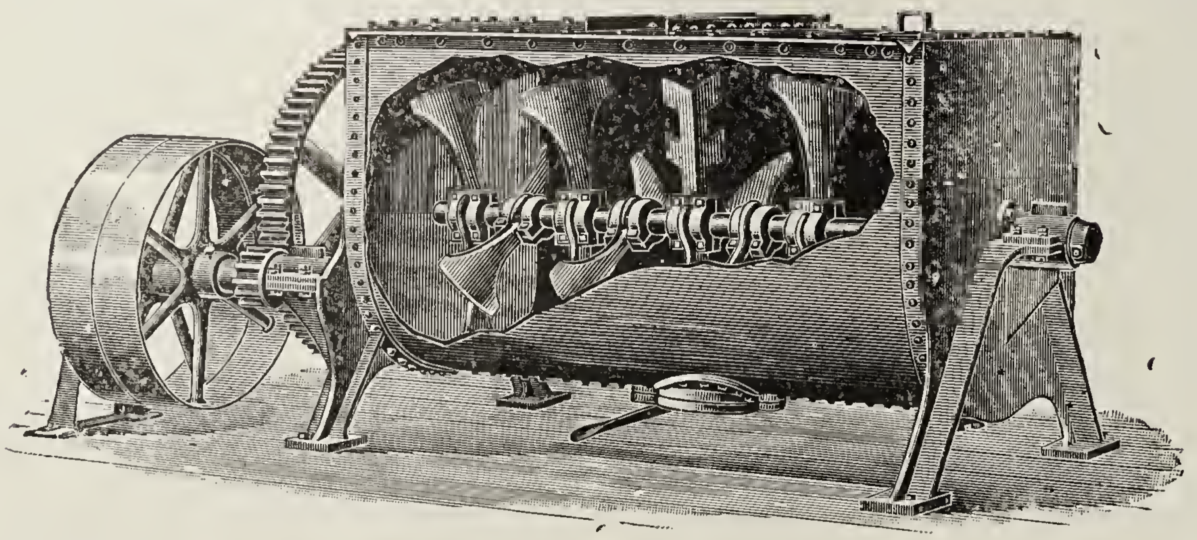
The Ackley Brick & Tile Co., Vinton, Ia., has added a new brick machine, cutter and crusher to their plant. In addition, a 35-horsepower Westinghouse electric motor will be installed.

August Buengener, Green Bay, Wis., has been appointed general salesman for the Brown County Brick Manufacturers' Association, instead of F. Hurlbut, who has thus been engaged for several years.

The Robinson-Graves Sewer Pipe Co., Ulrichsville, O., has been incorporated, with $100,000 capital stock, by Andrew Robinson, M. J. Robinson, C. L. Graves, G. D. Graves, W. H. Bergin and C. M. Bergin.

The Carlyle Paving Brick Co., Portsmouth, Ohio, has been incorporated, with $80,000 capital stock, by G. E. Carlyle, Leo. Hourse, T. L. Batten, W. L. Hitchcock and Simon Labold. The construction of the plant is about completed.

The Mt. Clemens Brick & Tile Co., Mt. Clemens, Mich., has declared a dividend of 16 per cent, and will at once put in new machinery and begin the manufacture of pressed brick. The directors are Henry Cadow, F. G. Kendrick, T. Van Damme, F. Grattop and B. Lemma.



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BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

FOR SALE.

A good established brick yard, in a city of 40,000 inhabitants, in Illinois. Plenty of clay, and can sell all the brick that can be manufactured. Good reason for selling. For particulars, address

S., care Clay Record,
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FOR SALE.

Brick and tile plant. Stiff Mud. Continuous kilns. Steam dryer. Good clay and excellent market.

D. W. TOWNSEND,
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FOR SALE.

One J. D. Fate A Special Auger Machine, 40,000 brick per day. In first class working order.

REDFIELD BRICK & TILE WORKS,
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FOR SALE.

20,000 fine pallets. $30.00 per thousand, F. O. B. cars here.

JOHN BUCKLEY,
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NEW AND SECOND-HAND MACHINERY FOF SALE.

One No. 6 Machine, capacity 50 to 75 thousand brick per day.
Three "Eli Jr" Brick and Tile Machines.
One "Little Eli" Brick and Tile Machine.
One No. 1-A Brick and Tile Machine, with square hopper.
One No. 1 Brick and Tile Machine, with upright pug mill, second-hand.
Two No. 2-B Brick and Tile Machines, with square hopper.
Two No. 5 Disintegrators, capacity 40 to 60 thousand per day.
Two No. 1 Disintegrators, capacity 25 to 35 thousand per day.
Three Winding Drums or Hoists.
One "D" Freese Tile Machine, second-hand.
One 30 h. p. Engine.

Above machinery is same as new and will be sold cheap. It is guaranteed to be as represented in circulars mailed on request.

JAMES F. CLARK,
Morenci, Mich.

Machinery For Sale.

FOR SALE.

50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets. Track gauge 25 inches.
Both styles of cars in first-class repair.

ATLAS CAR & MFG. CO.
Cleveland, Ohio

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine. Address

"GIANT,"
Care Clay Record, Chicago.

FOR SALE CHEAP.

One Steam Power Soft Mud Brick Machine.
15,000 feet of one-inch Pipe.
100 Single Deck Cars, with pallets for soft mud.
25,000 Pallets and Racks for same for outside drying.
Three Transfer Cars.
One Centrifugal Pump, with cable transmission.

O. W. DUNLAP,
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FOR SALE—CHEAP—1200 Steel Crimped Pallets. 10x34 inches. Address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—New and re-laying rails, 12, 16, 20 and 25 pound. For prices, address

ATLAS CAR & MFG. CO.,
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FOR SALE.

Four-Mold Dry Press, absolutely as good as new, made only one kiln of brick. Can sell for less than half original price. Address

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One E. M. Freese & Co. stiff mud Union Brick Machine, with pug mill combined. Special size.
One E. M. Freese & Co. rotating automatic cutter.
Two Stevenson nine-foot iron dry pans.

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FOR SALE CHEAP.

One "Freese" Union Brick and Tile Machine, size No. 1, with dies and table. Good running order. Address

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One Conical Smooth Roll Crusher No. 25, Style "F," manufactured by American Clay Machinery Co., Bucyrus, O. One No. 5 board delivery side-cut Brick Table. This table has never been used. For information, write

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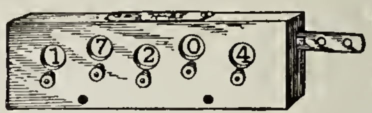

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5 Wheel, $3.25
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WANTED.

A second-hand three-mold Andrus Press, in good condition. Prefer only Andrus type, as I am already using one on my yard. In naming price give length of time used and present condition.

CHEAP, care Clay Record,
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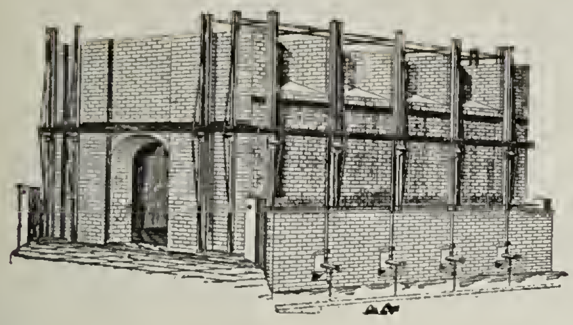

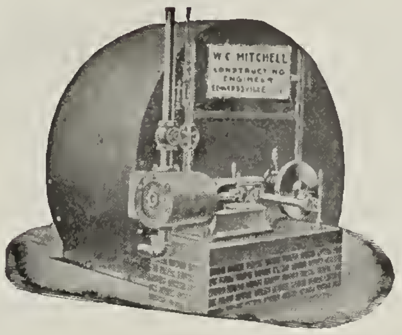

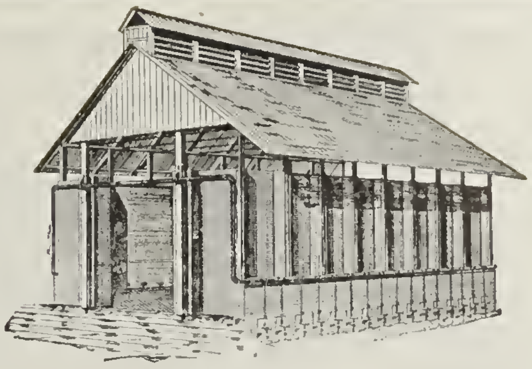

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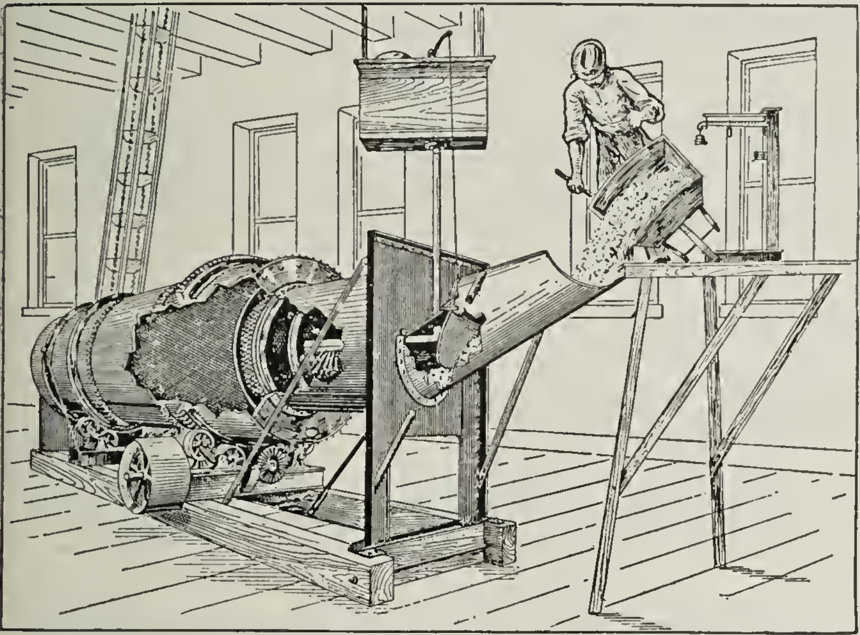

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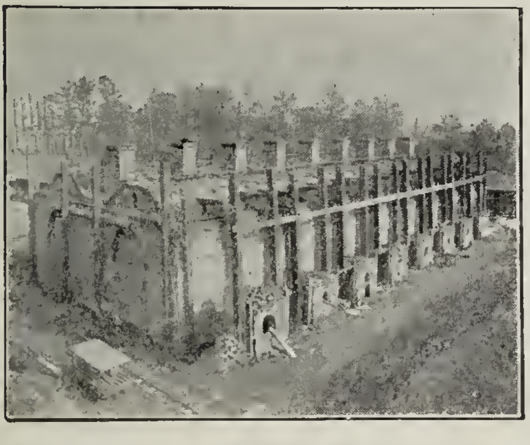

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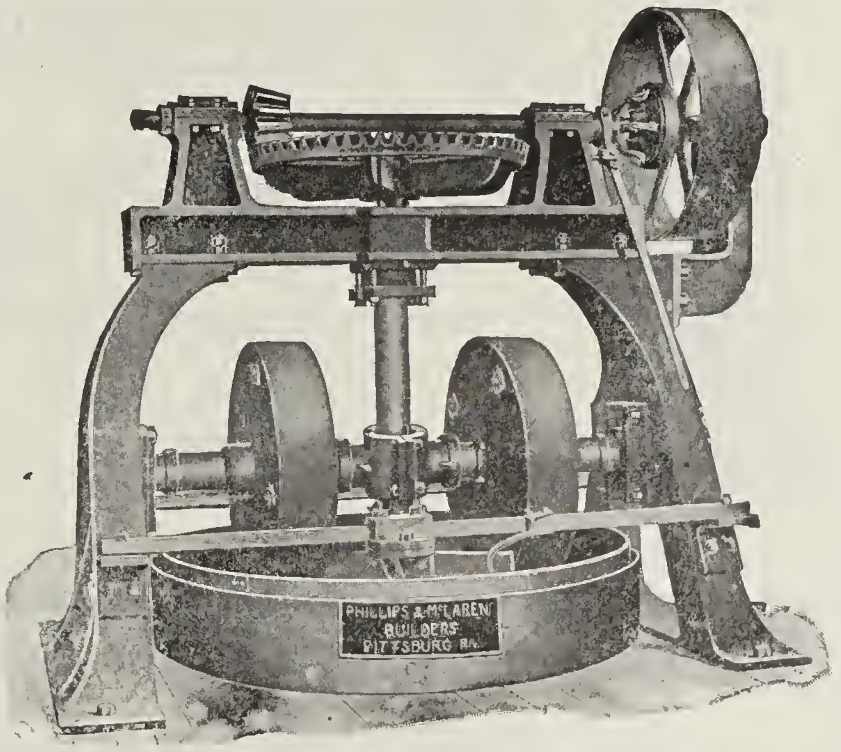

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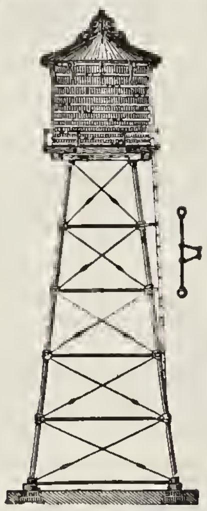

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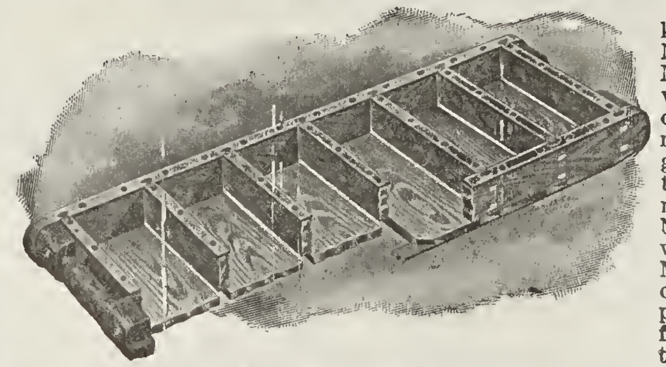

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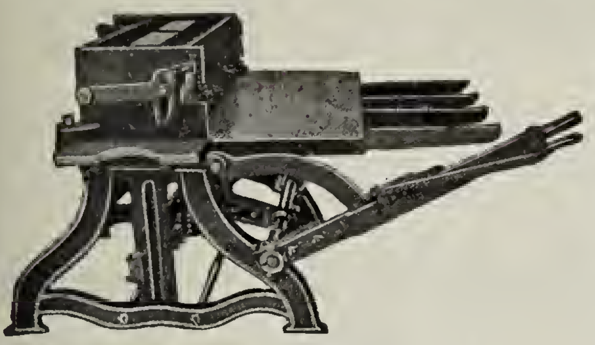

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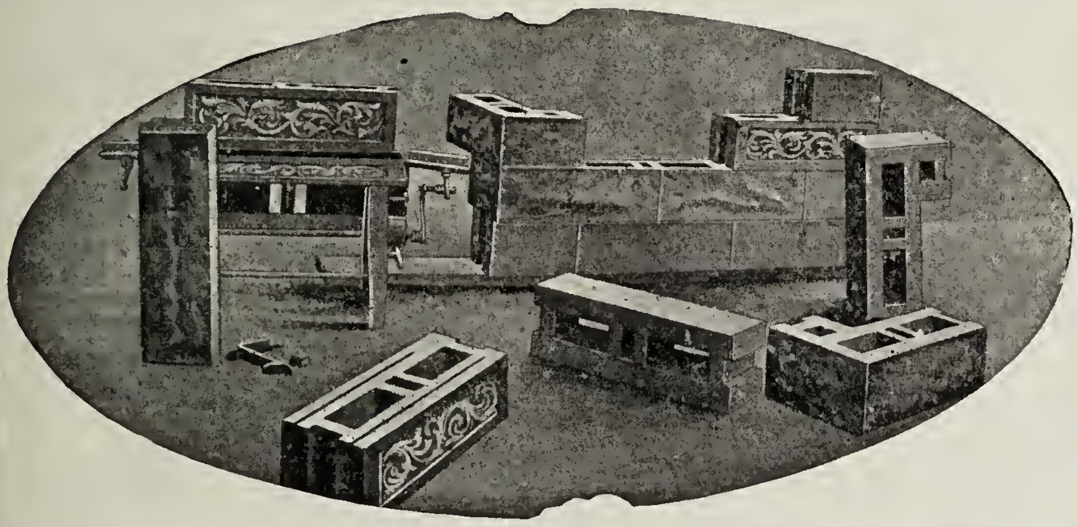

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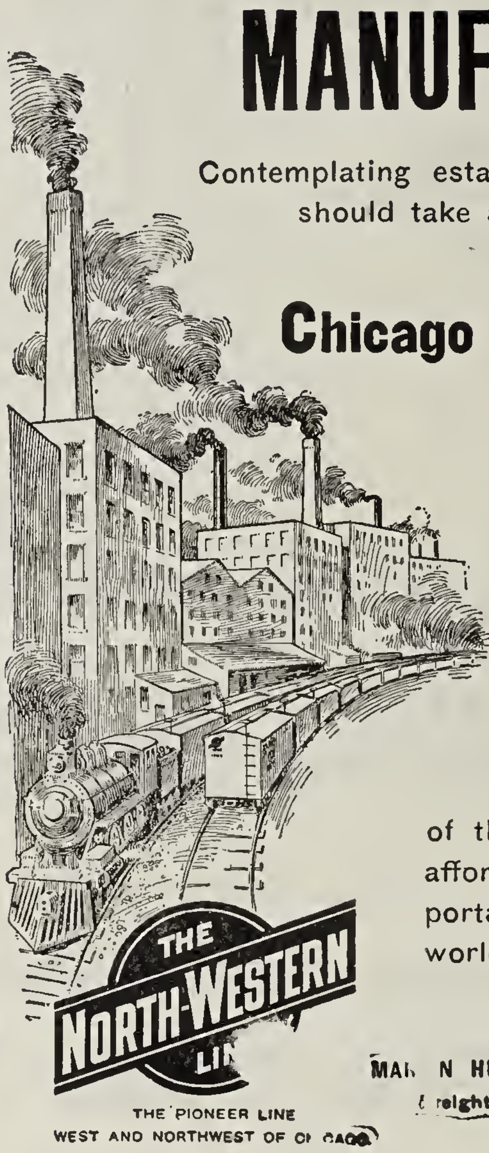

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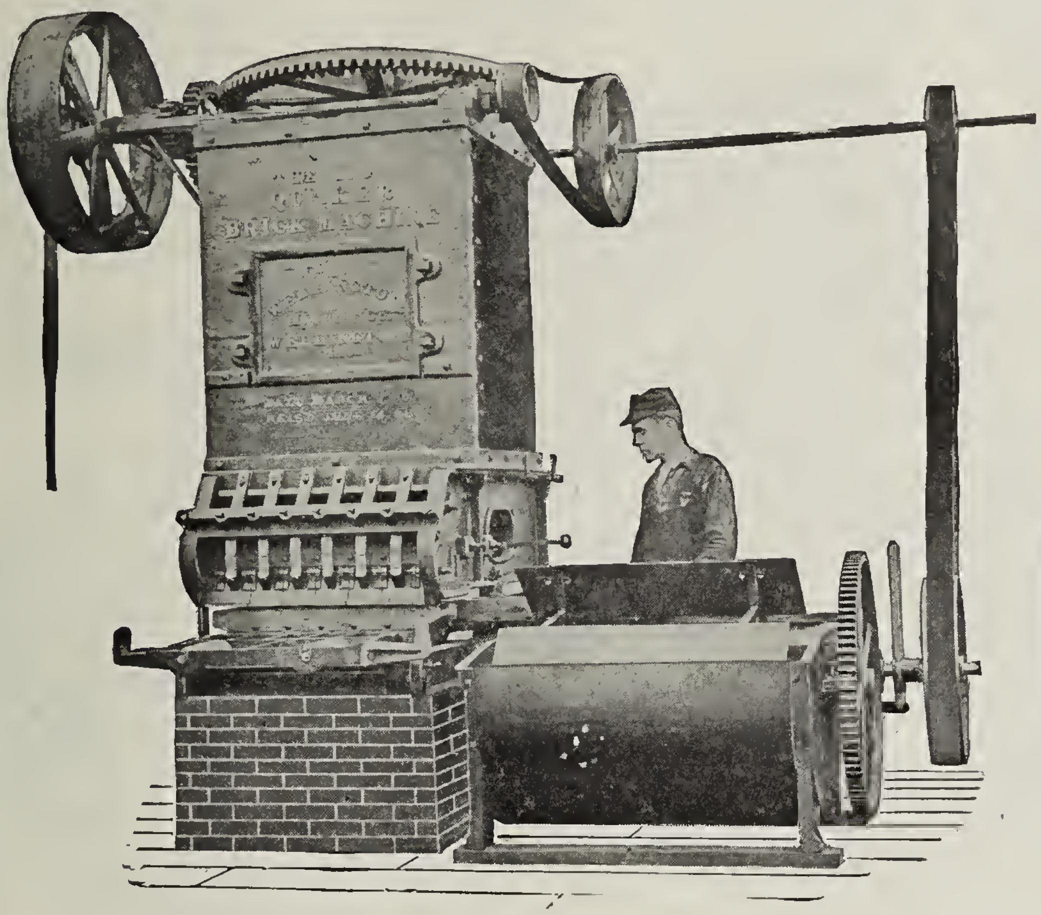

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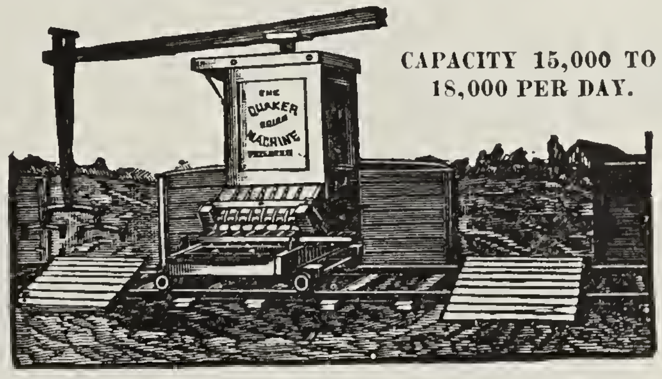

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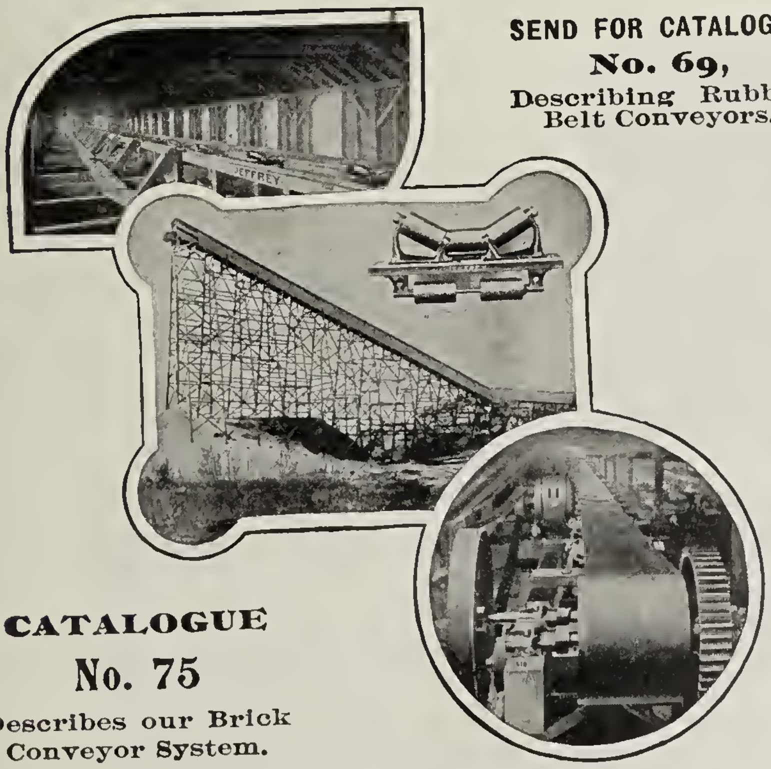

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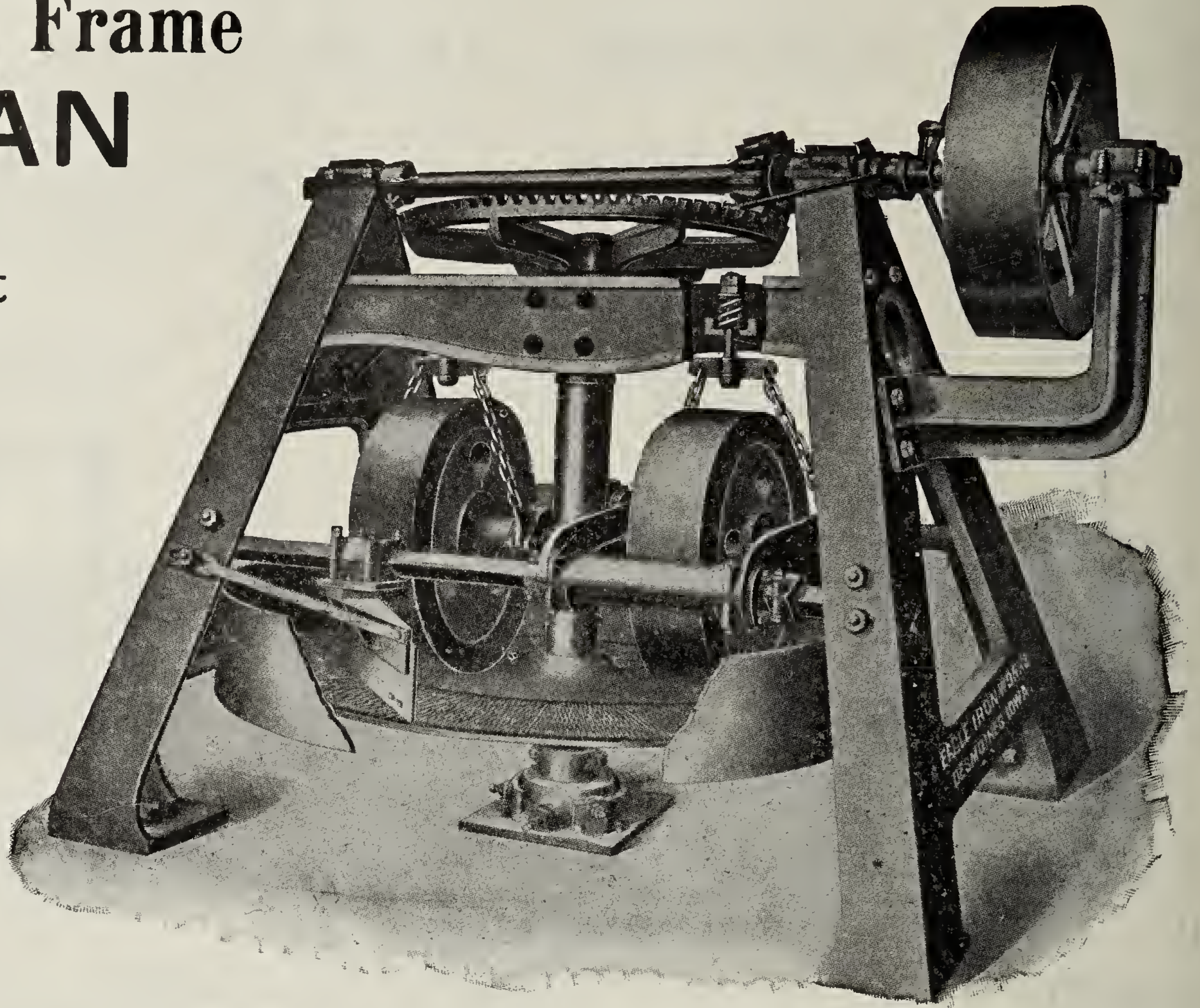

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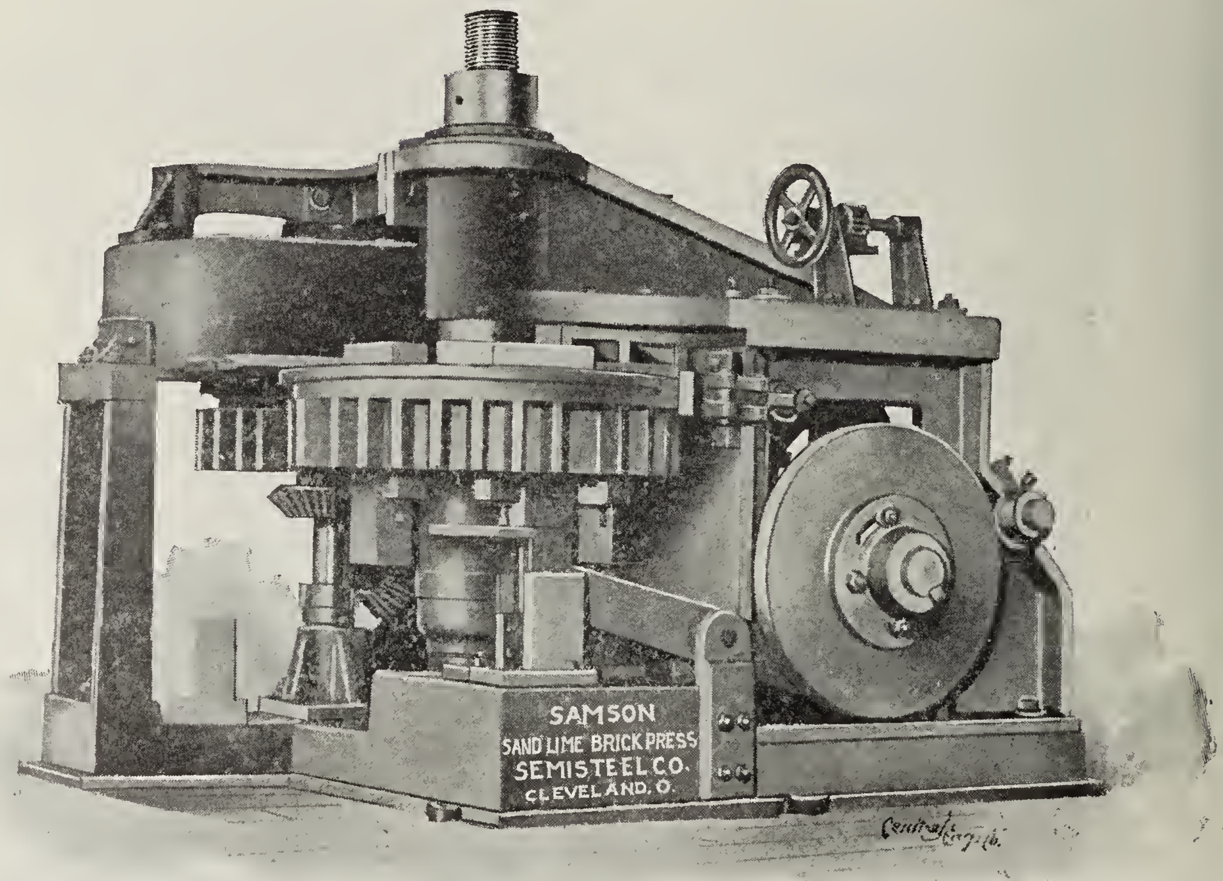

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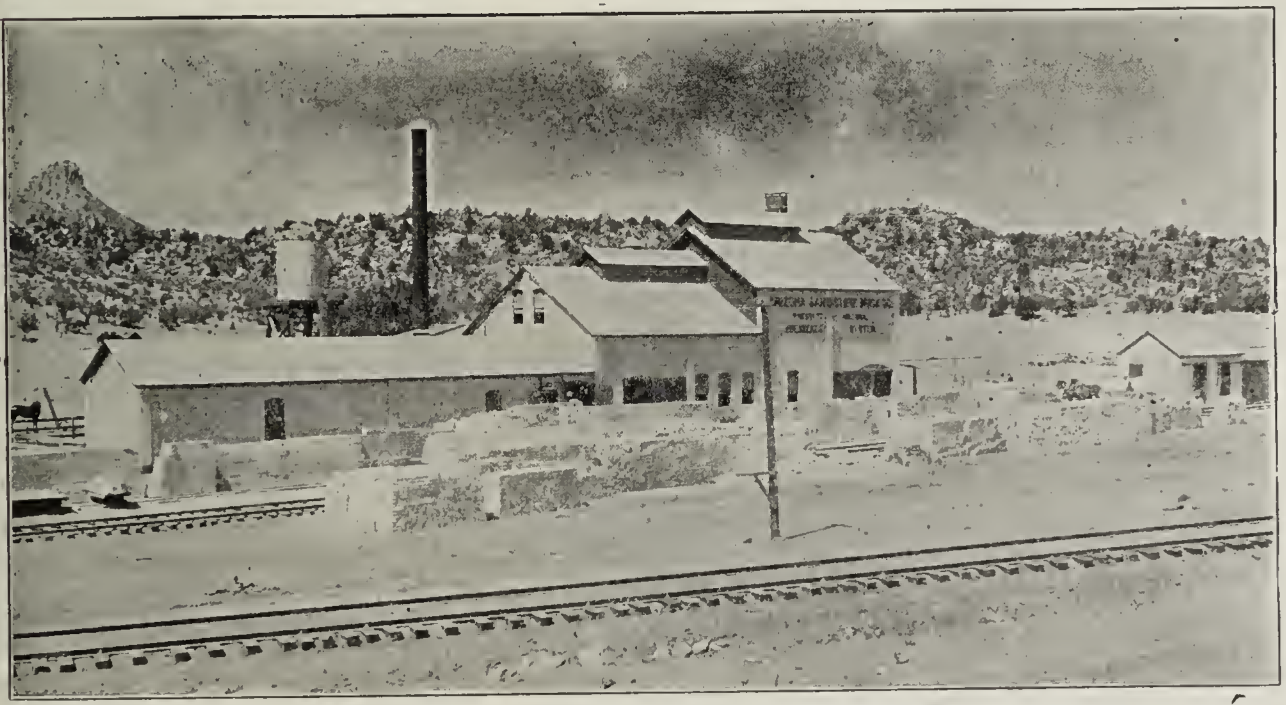

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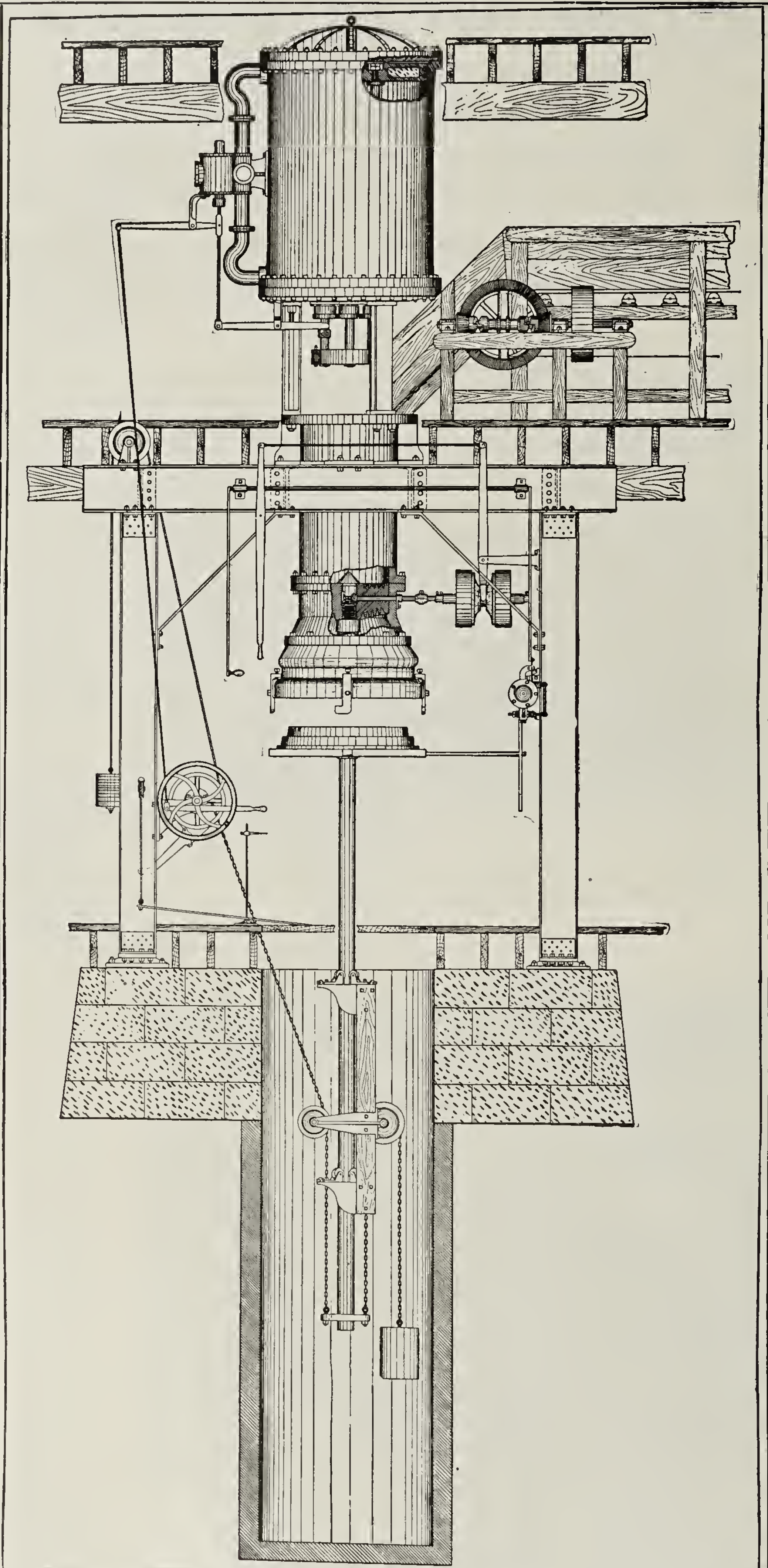

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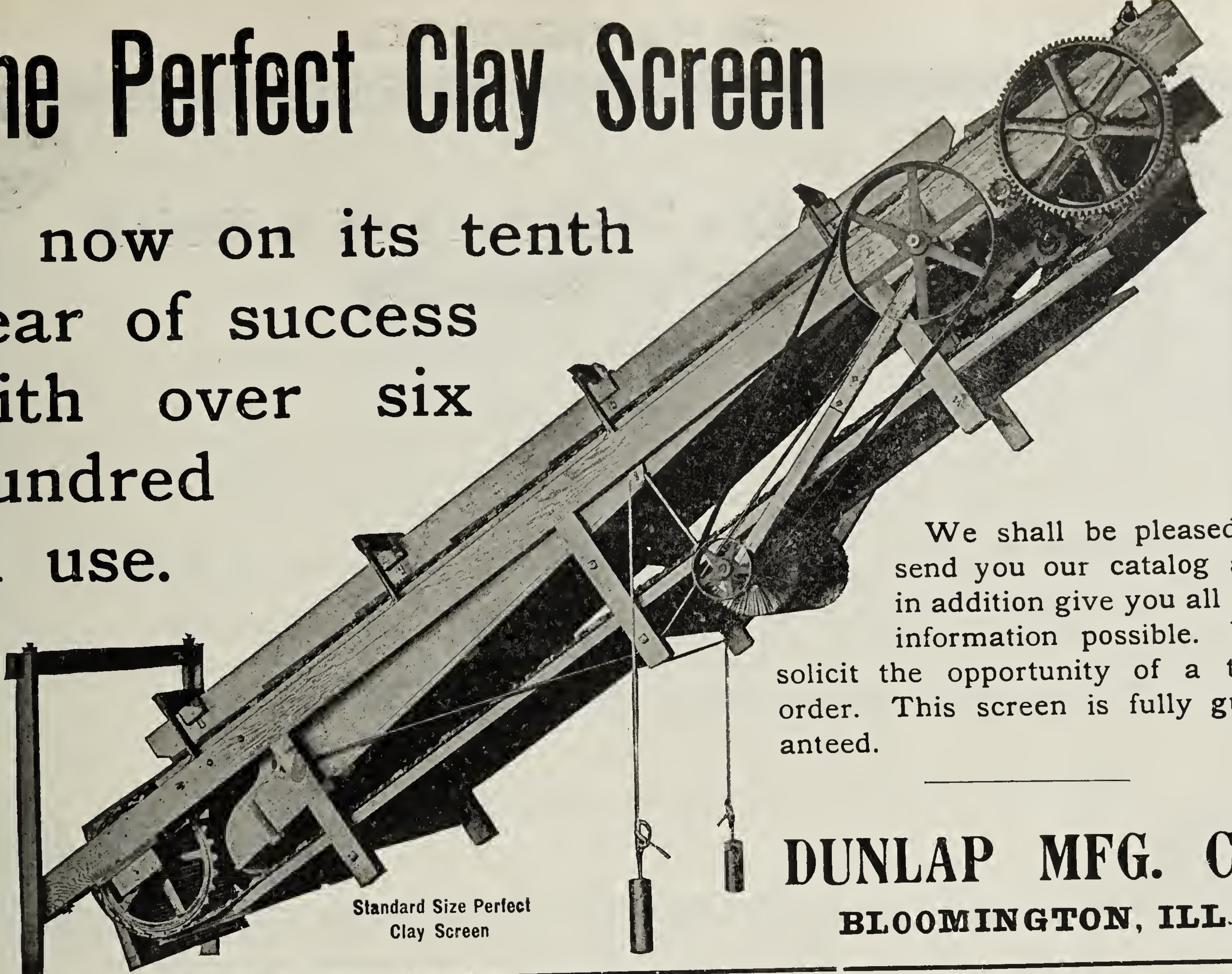

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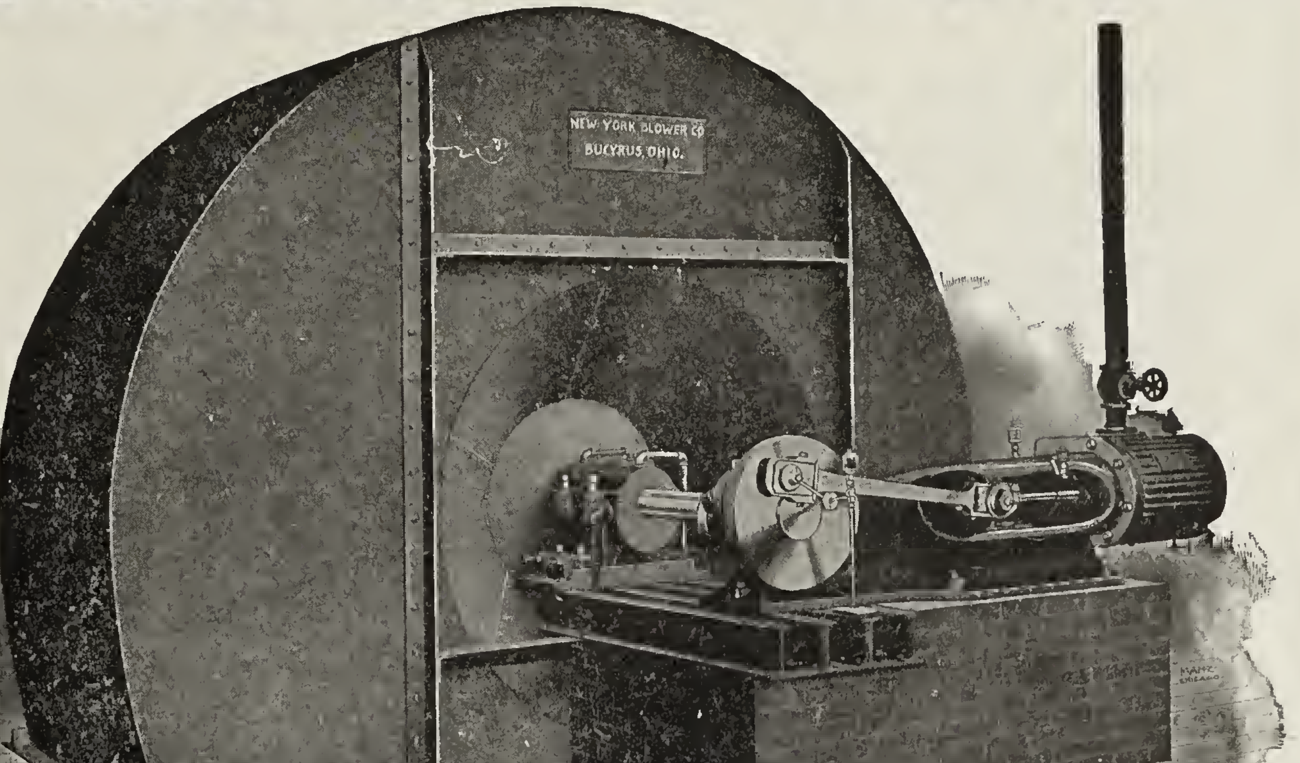
We offer the New York Blower Company's Improved Waste Heat Dryer as the most successful means of utilizing the heat from the cooling kilns which is at present an absolute waste. The two important factors in drying are heat and circulation of air; one being as important as the other. These are both amply provided for in our dryer. By the use of mixing chamber, provided with the proper dampers fresh air can be admitted to the fan to reduce the temperature of the incoming gases to the proper degree. By changing the speed of the fan the amount of air blown into the tunnels is easily regulated. With this apparatus, by which you can readily regulate and control the heat and circulation, you have a dryer which will work successfully in all climates and temperatures The necessity of perfect circulation in a dryer should never be overlooked. With this end in view we provide additional circulating devices in our largest dryers. This maintains an even and positive circulation throughout the dryer and insures the successful drying of your brick.



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A Drier is the Measure of a Brick Plant's Capacity

Are you satisfied that you are getting every dollar's worth of efficiency out of your clay working enterprise?

As a chain is only as strong as its weakest link, so it is with the brick plant equipped with an inefficient Drier. Where the Drier is too small for the plant's capacity, the A No. 1 brick machine, first-class men and excellent kilns must wait the pleasure of the "weak link"—the Drier.

The Rodger's Drier is always ahead of time.
Make your Waste Heat dry your brick.

L. E. RODGERS ENGINEERING CO.
WASTE HEAT DRYER SPECIALISTS
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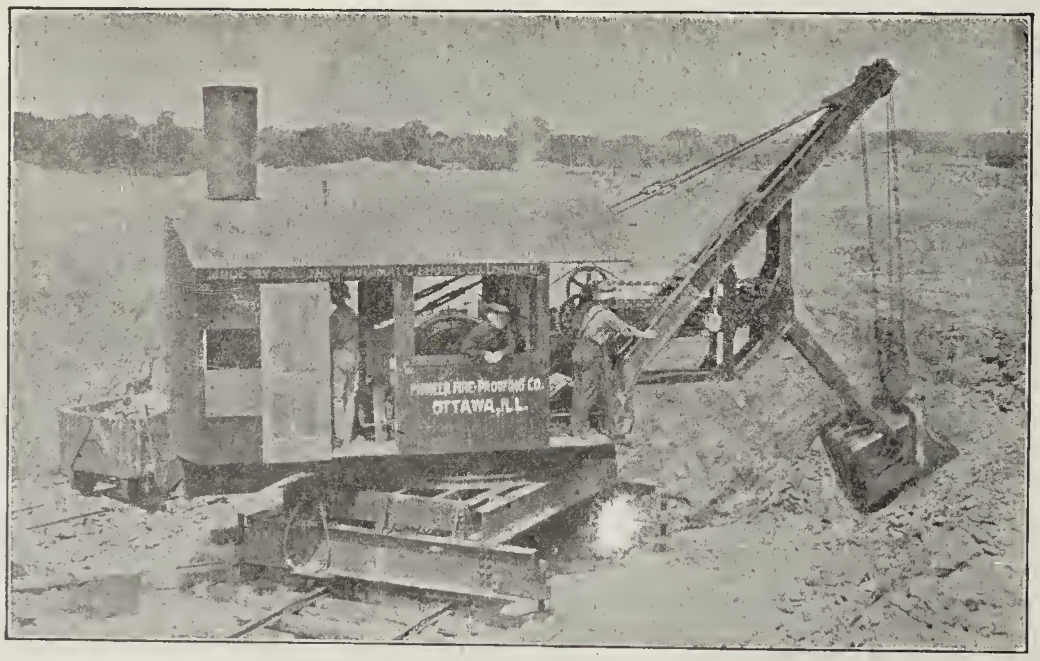
HANDLE YOUR CLAY WITH ONE MAN AND

The Thew Steam Shovels

Made In Four Sizes. Mounted on Car Wheels or Traction Wheels.



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: : Only One Operator Required.
Wire Cables used instead of Chains.
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Operated by one man for outputs up to 125,000 brick per day.

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LORAIN, OHIO.

A Perfect Clay Handling System.

We install our system and turn it over to you under guarantee of satisfactory results.

We do not shut your plant down while installing.

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Scarcely any power required.

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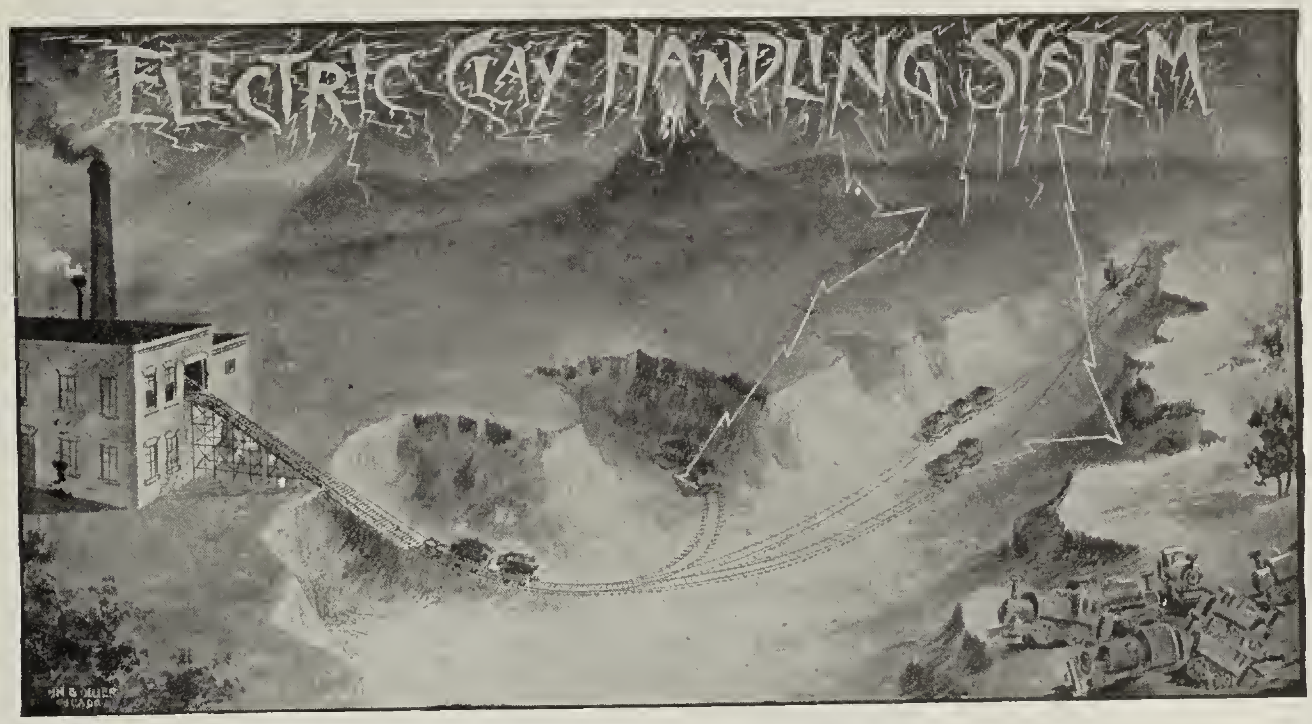

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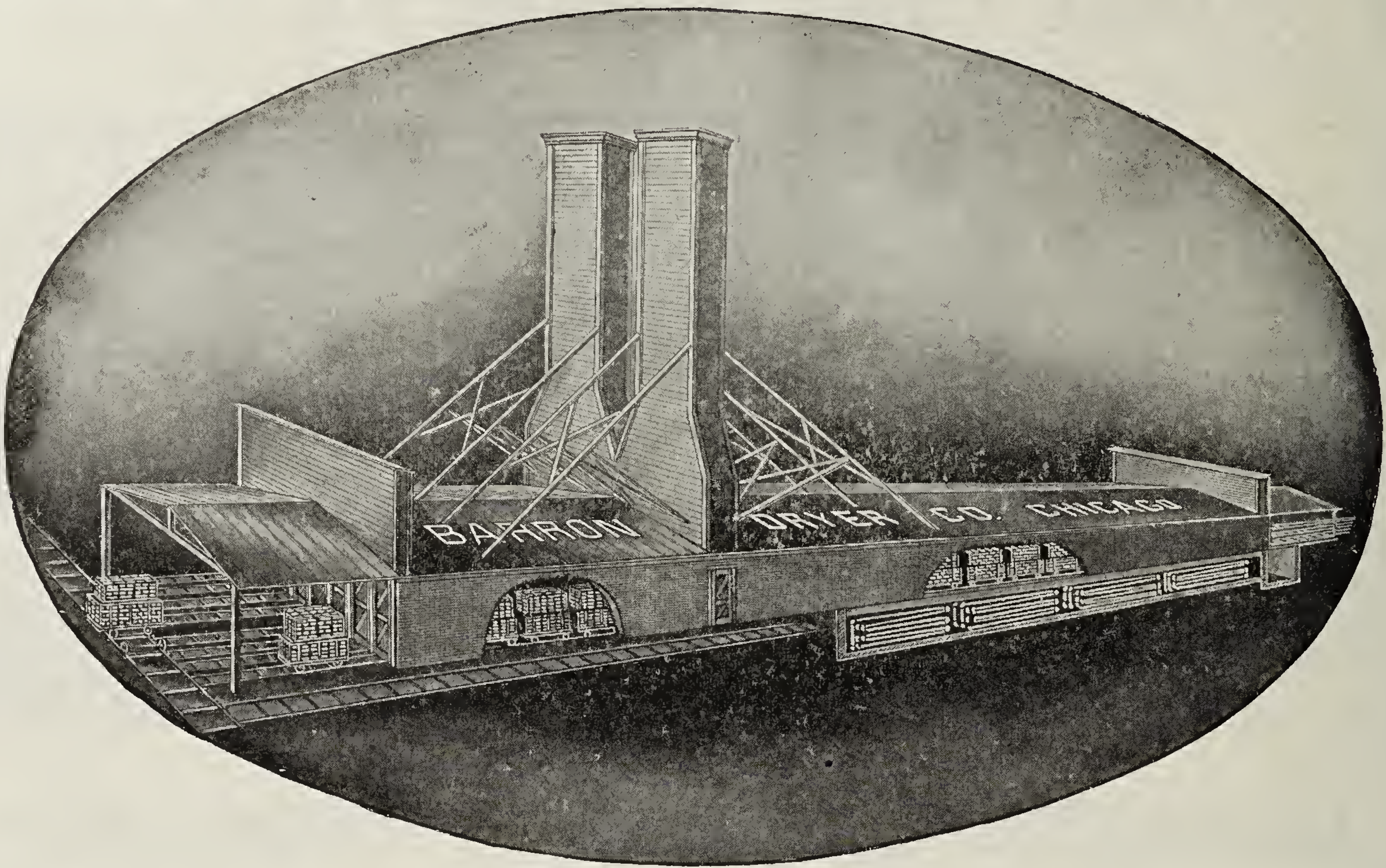

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You know that the brickmakers who are making the money in these days are those who have installed an up-to-date drying system enabling them to cope with ease with the heaviest demands of the market, their operations being uninterrupted all the year round.

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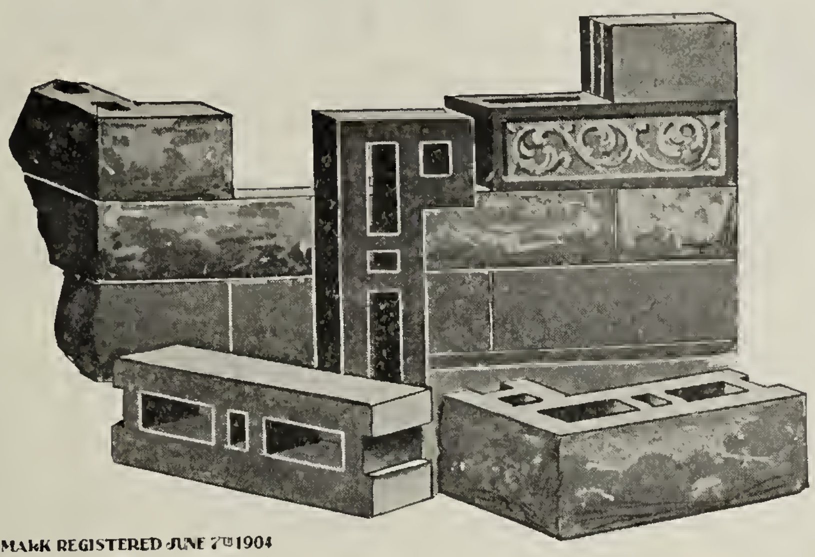

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It makes blocks of different contour by removable face plates with patented designs.

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It is not a cumbersome and bungling piece of mechanism.

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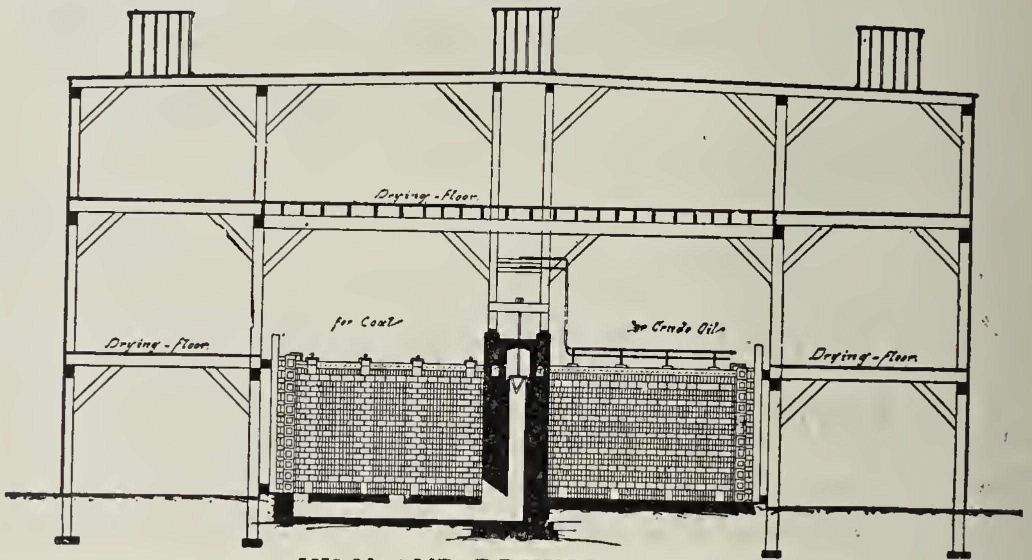

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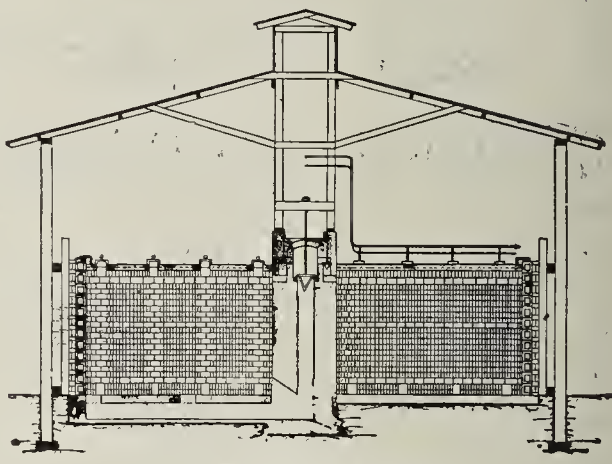

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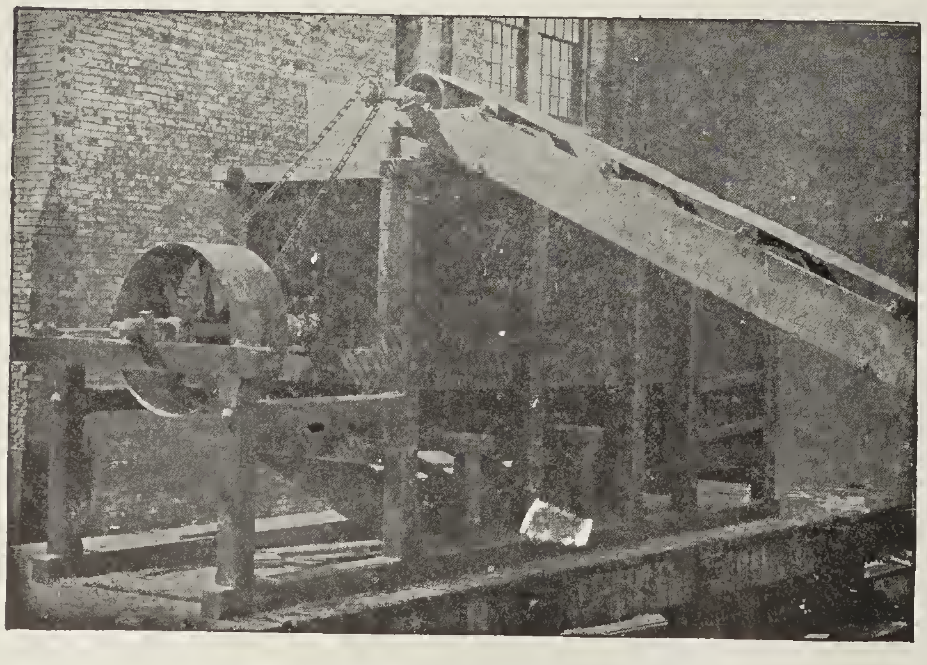

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That give satisfaction
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That don't twist . . .
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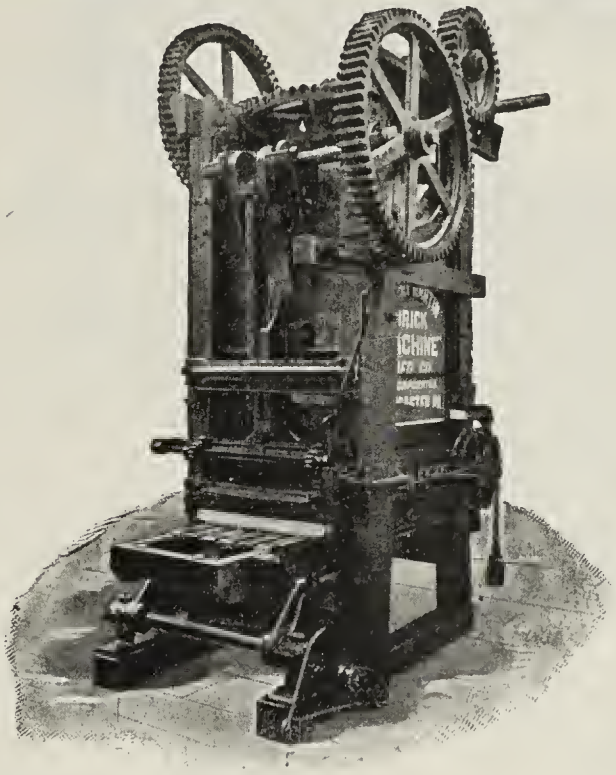

There's none can equal it for service.
It's the most satisfactory machine to operate.
Turns out over 50,000 brick a day.
Just the machine for making fire brick.

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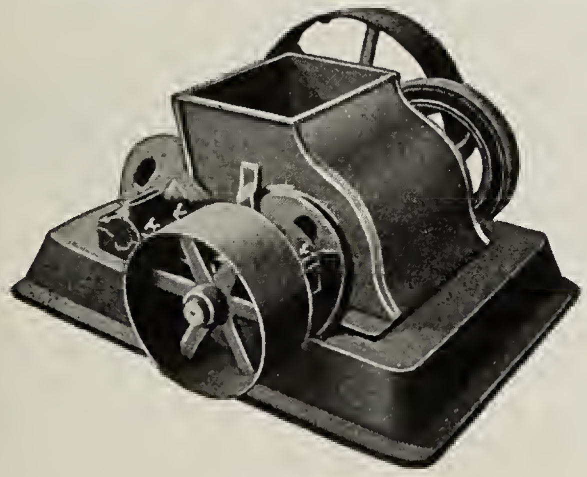

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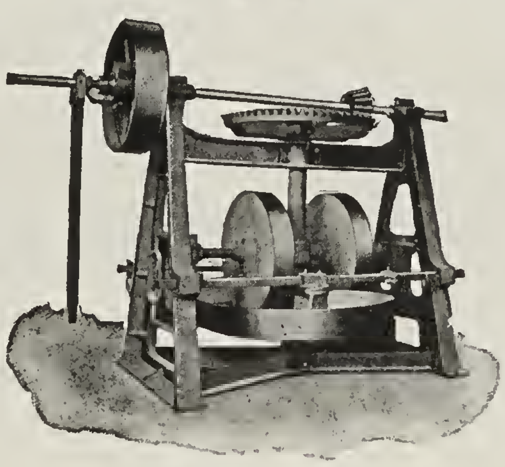

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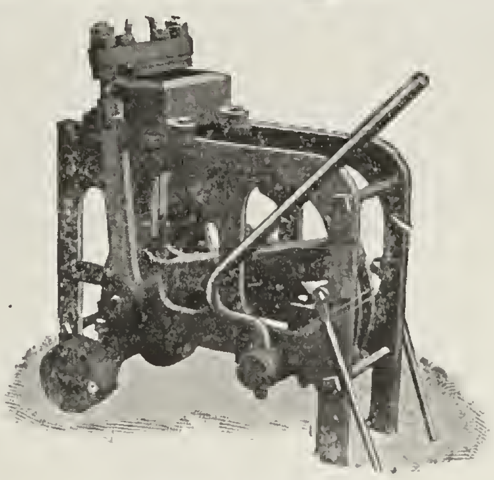

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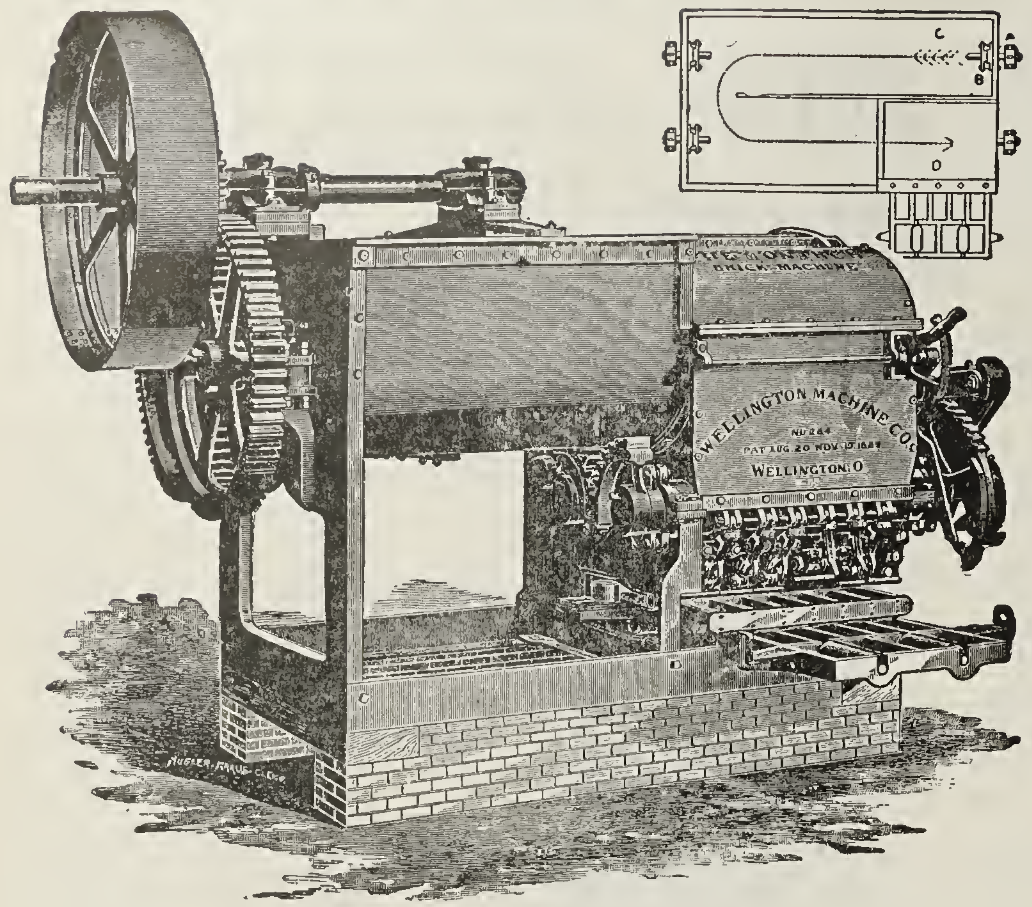

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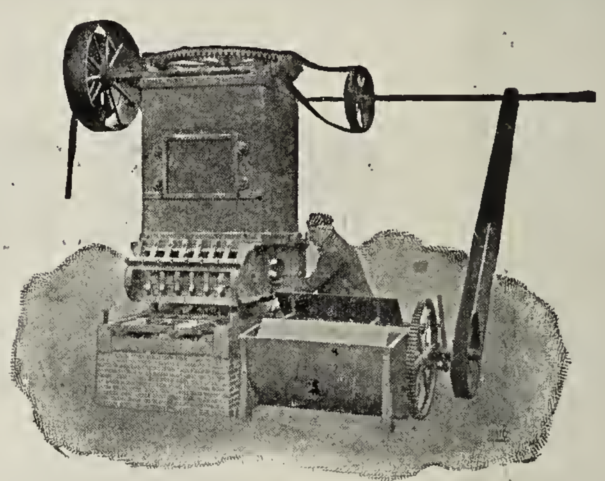

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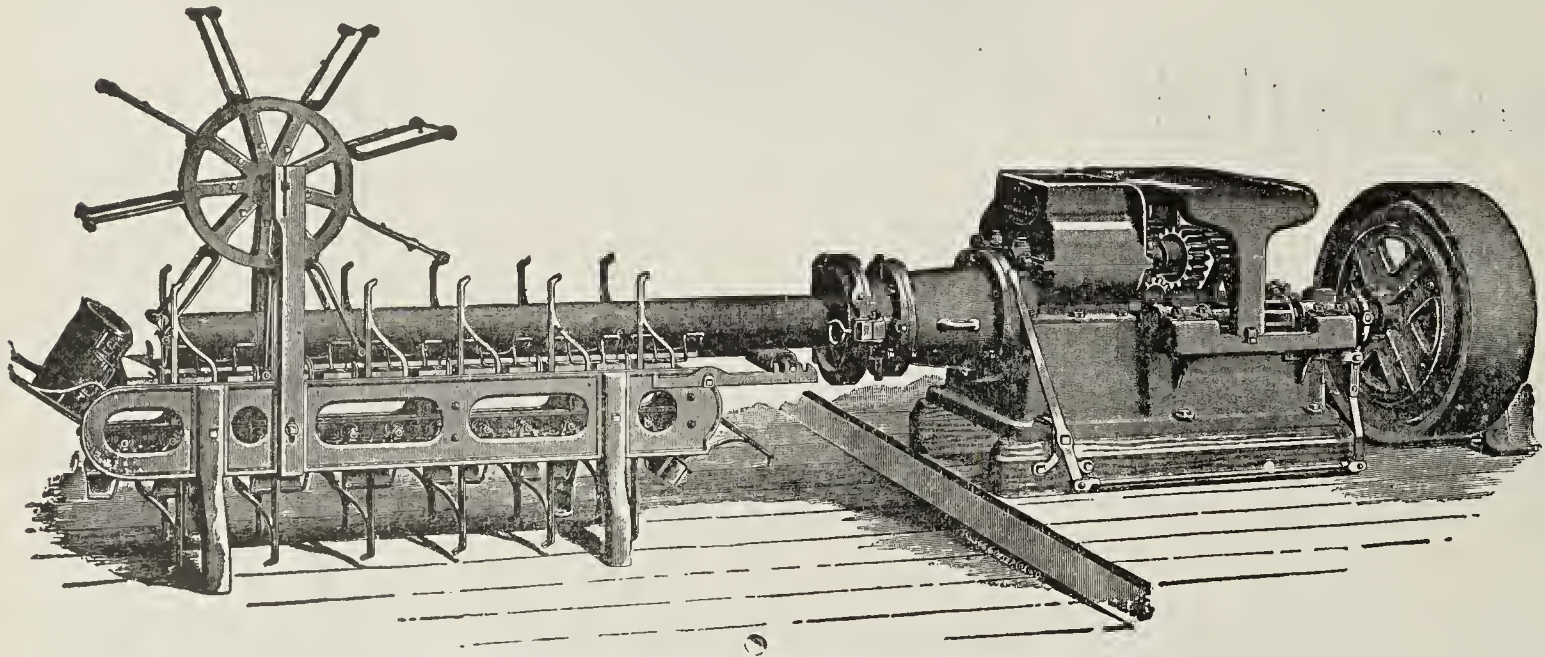

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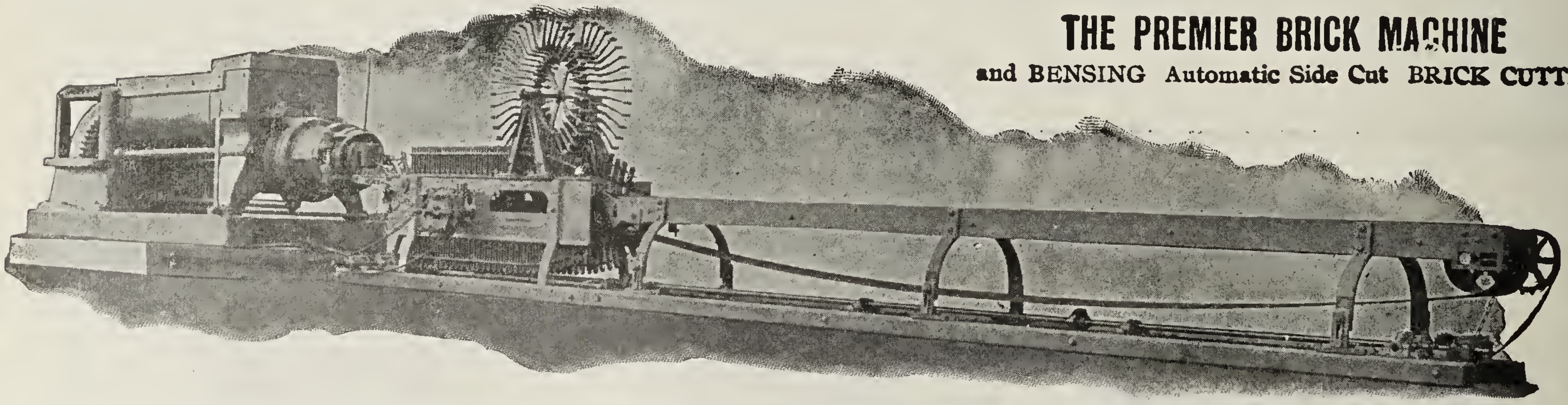

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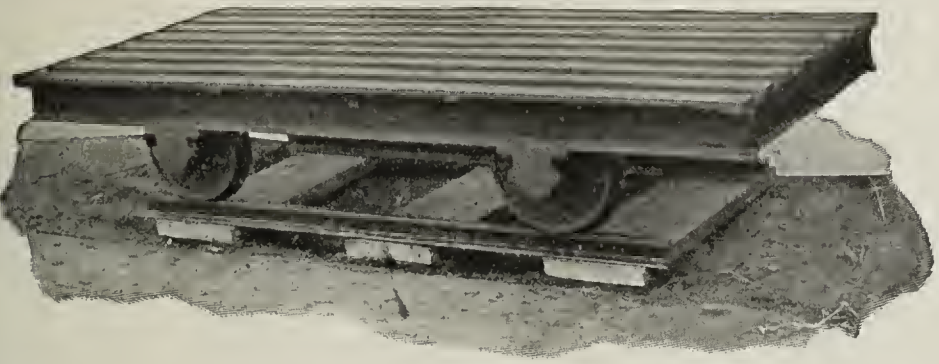

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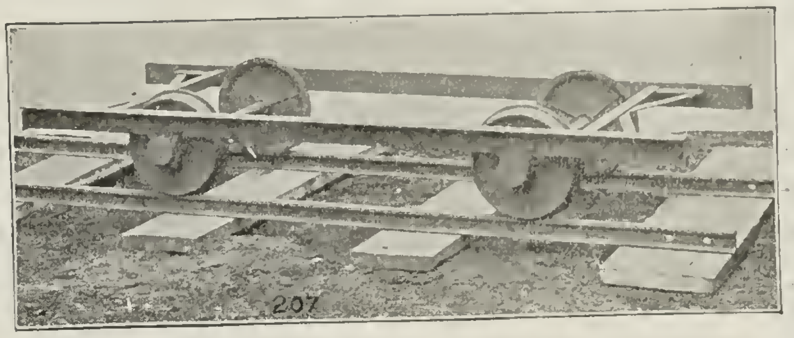

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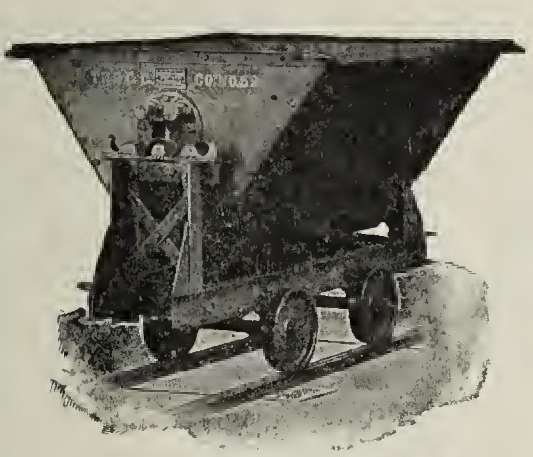

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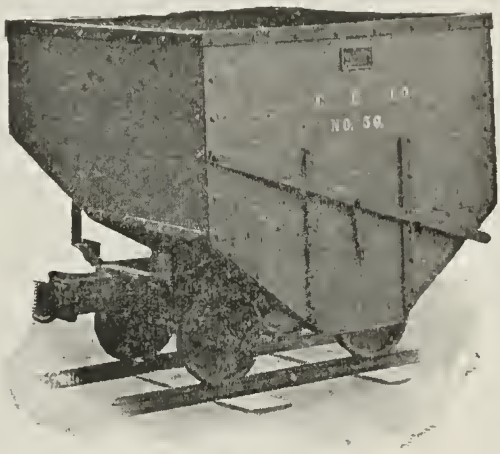

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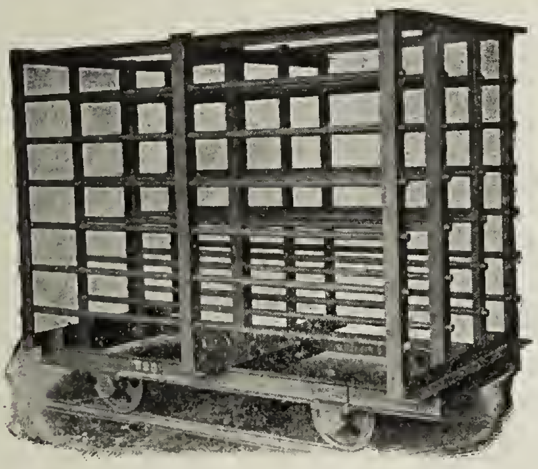

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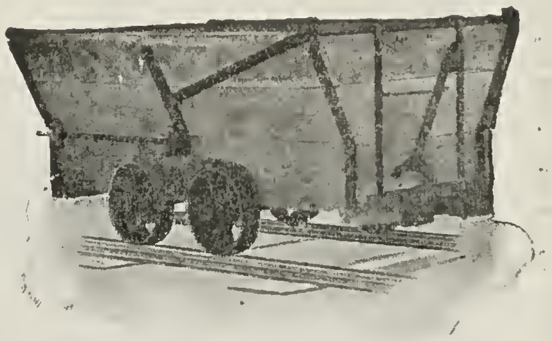

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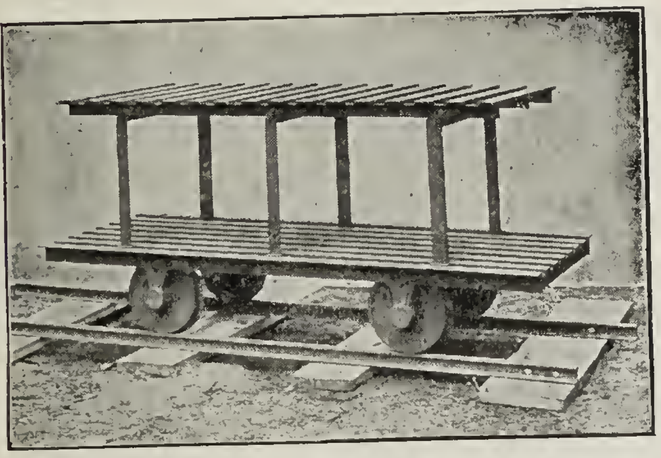

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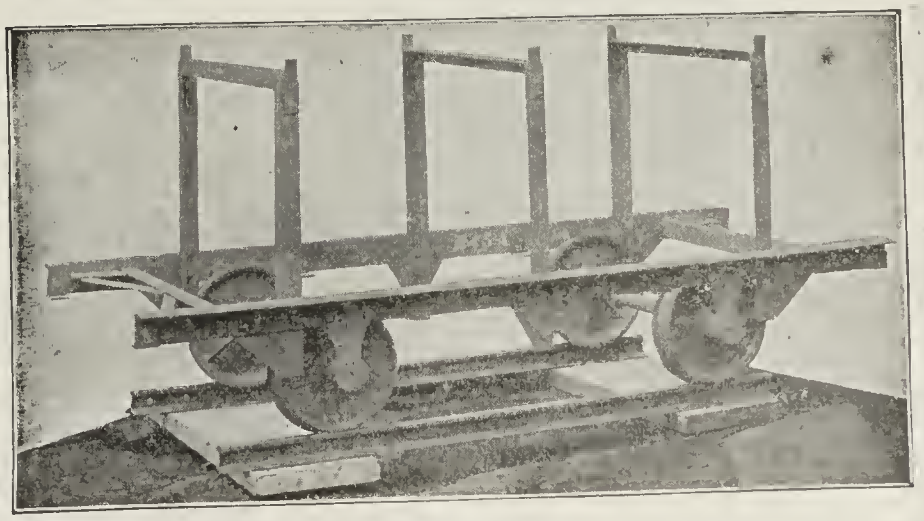

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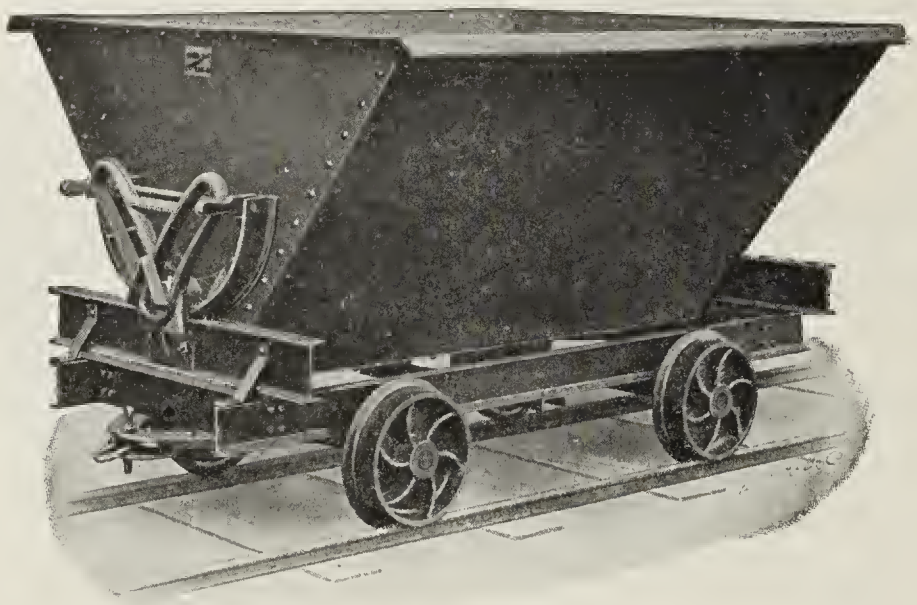

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If not, we can send some which we guarantee will be. They have no chains or pins to get lost or broken, cars cannot overdump, are self-locking, self-centering, easy running and durable.

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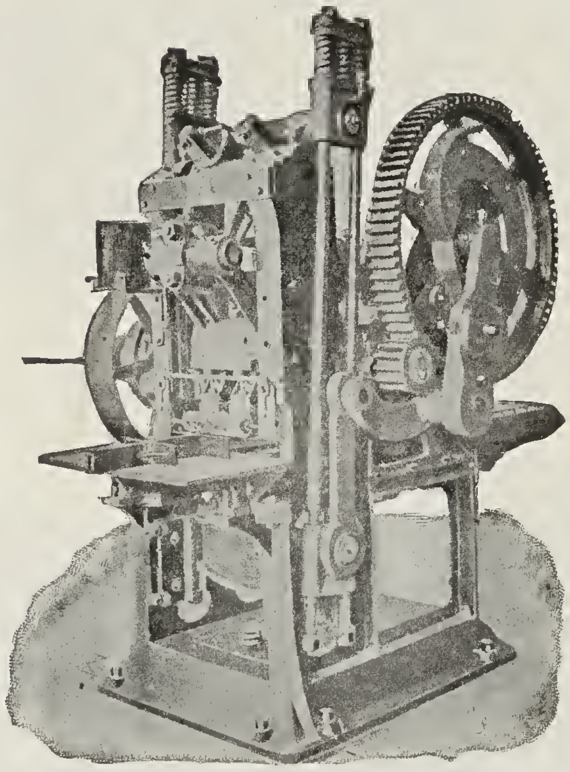

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The Richardson Repress has all the features of merit that are demanded of a machine of this kind. Has enough depth of mold to make the largest size paving brick. All the working parts are above dies out of the way of waste clay. It has a slow pressing movement with double pressure, bringing out distinctly all markings and lettering. The working parts are adjustible to wear. It requires very little power and costs little to keep in repair.

Kindly write us for catalogs and full information.

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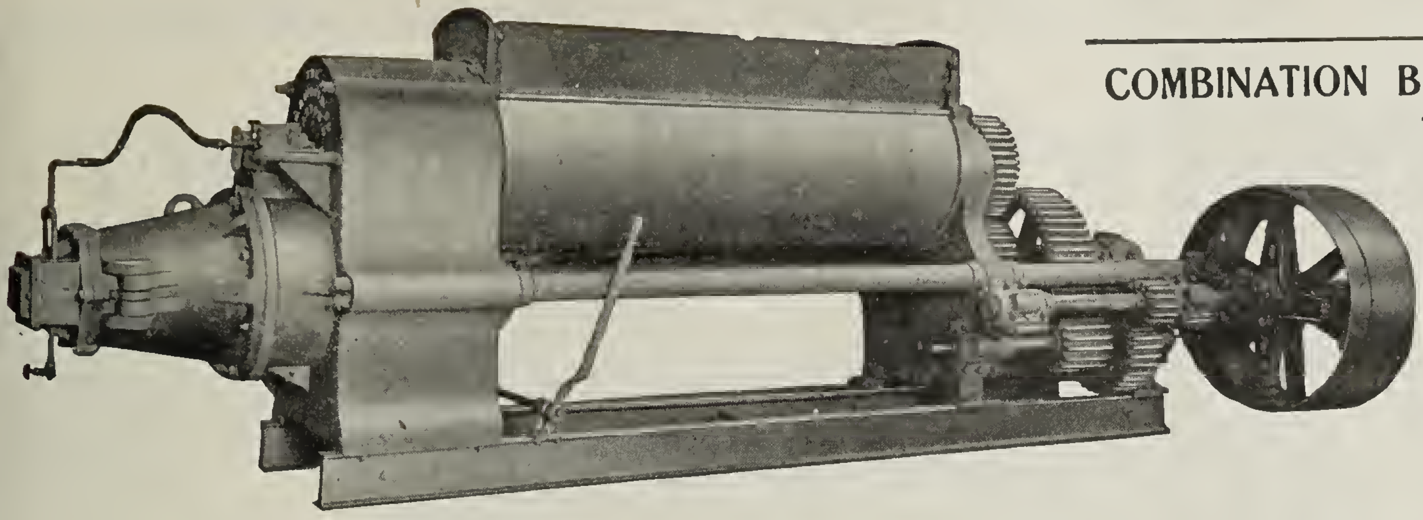

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THE

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Clay-Working Machinery

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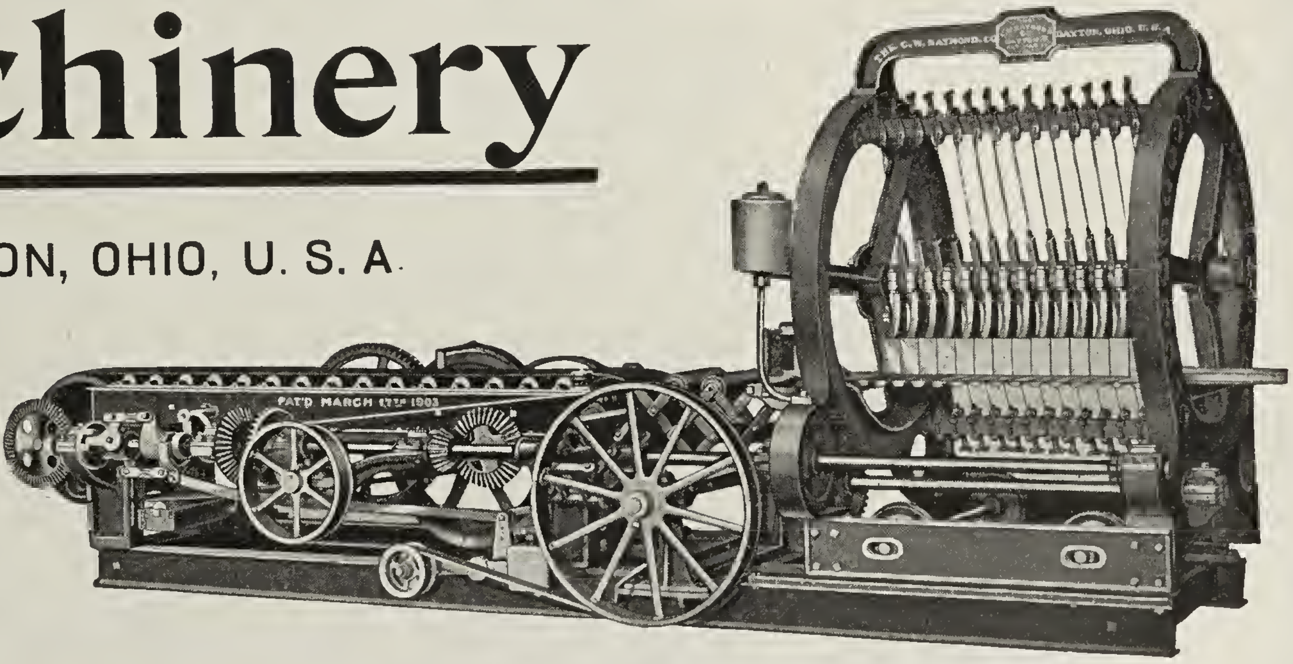
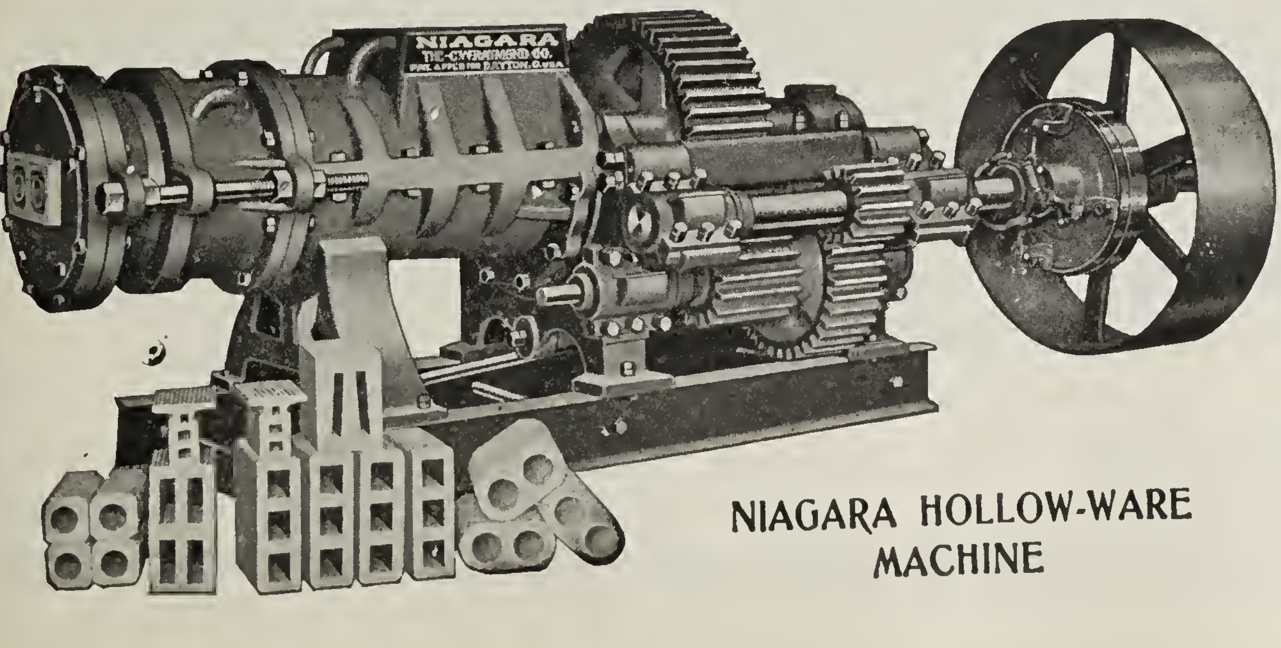


AUTOMATIC DOWN-CUT CUTTER



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Raymond Machinery
Creates New
Business for the User
Better Brick
and more of them.

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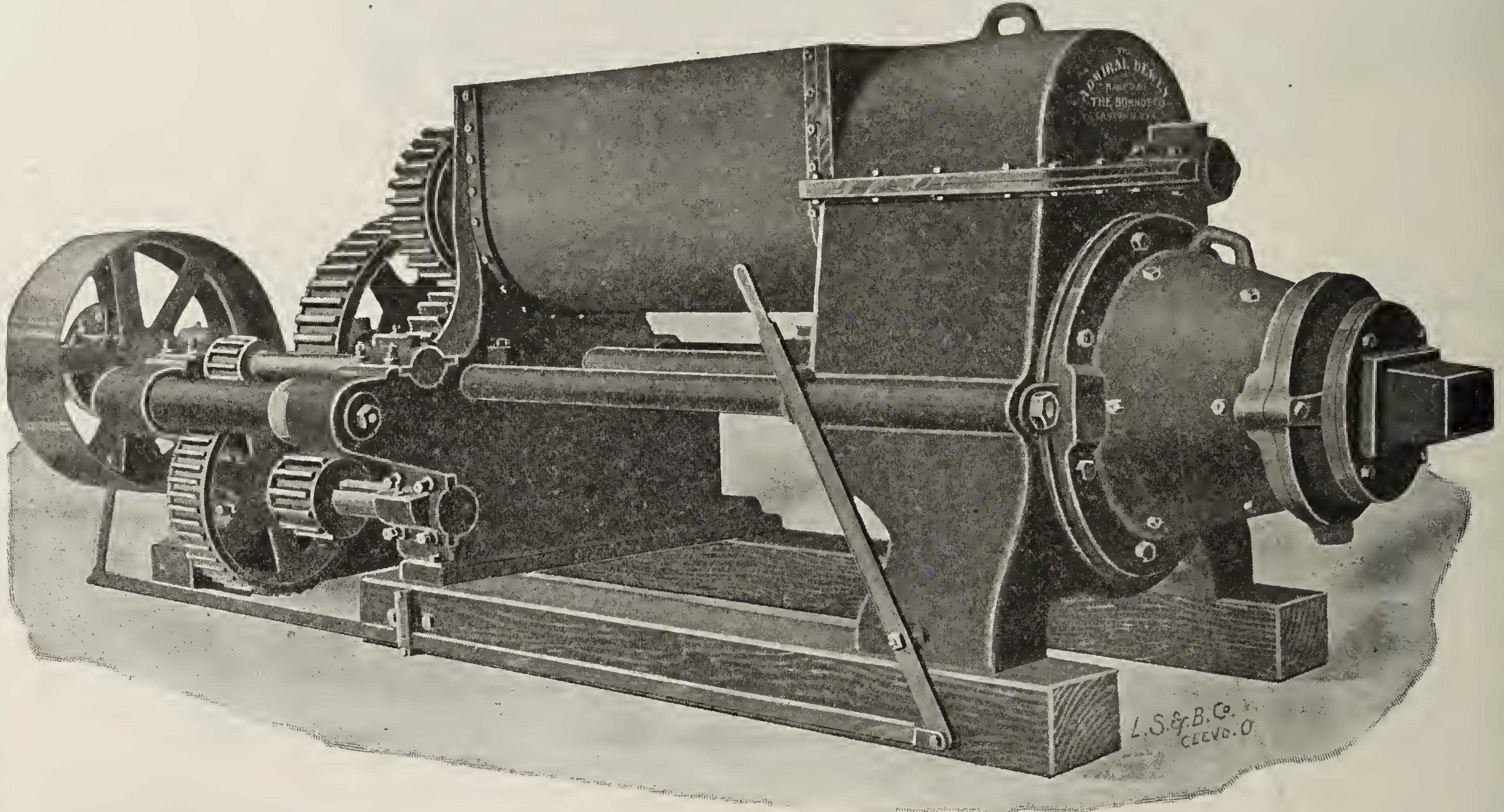

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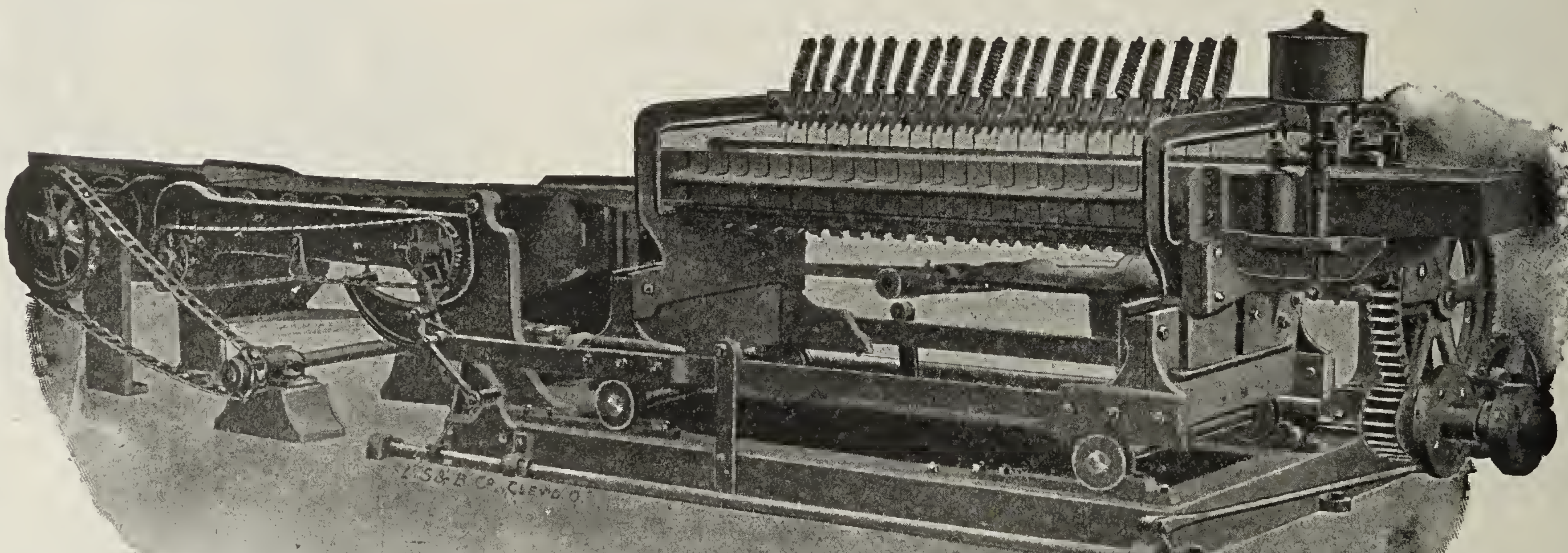

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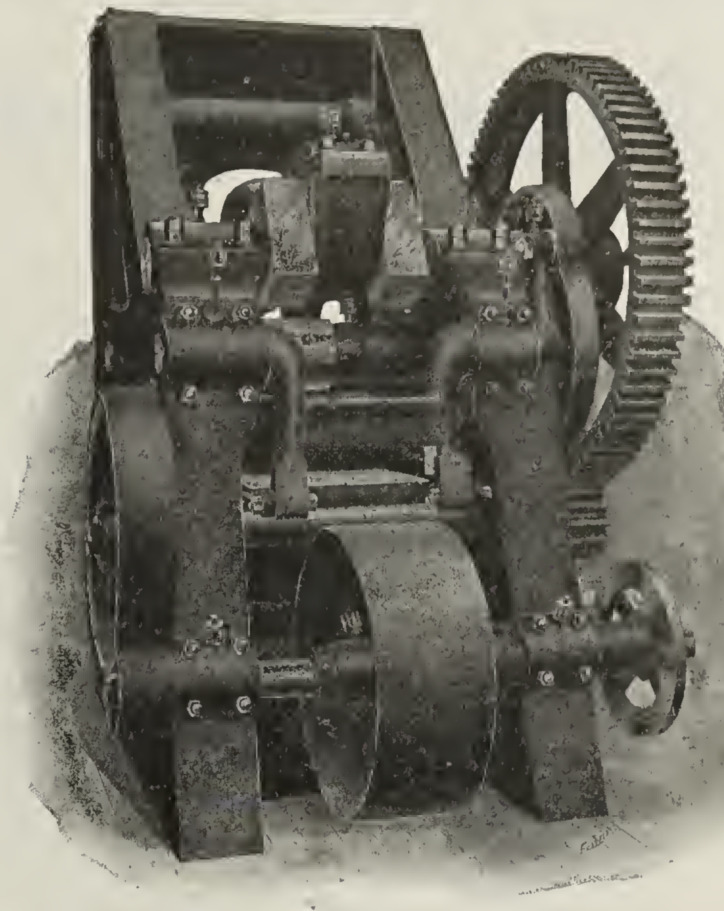

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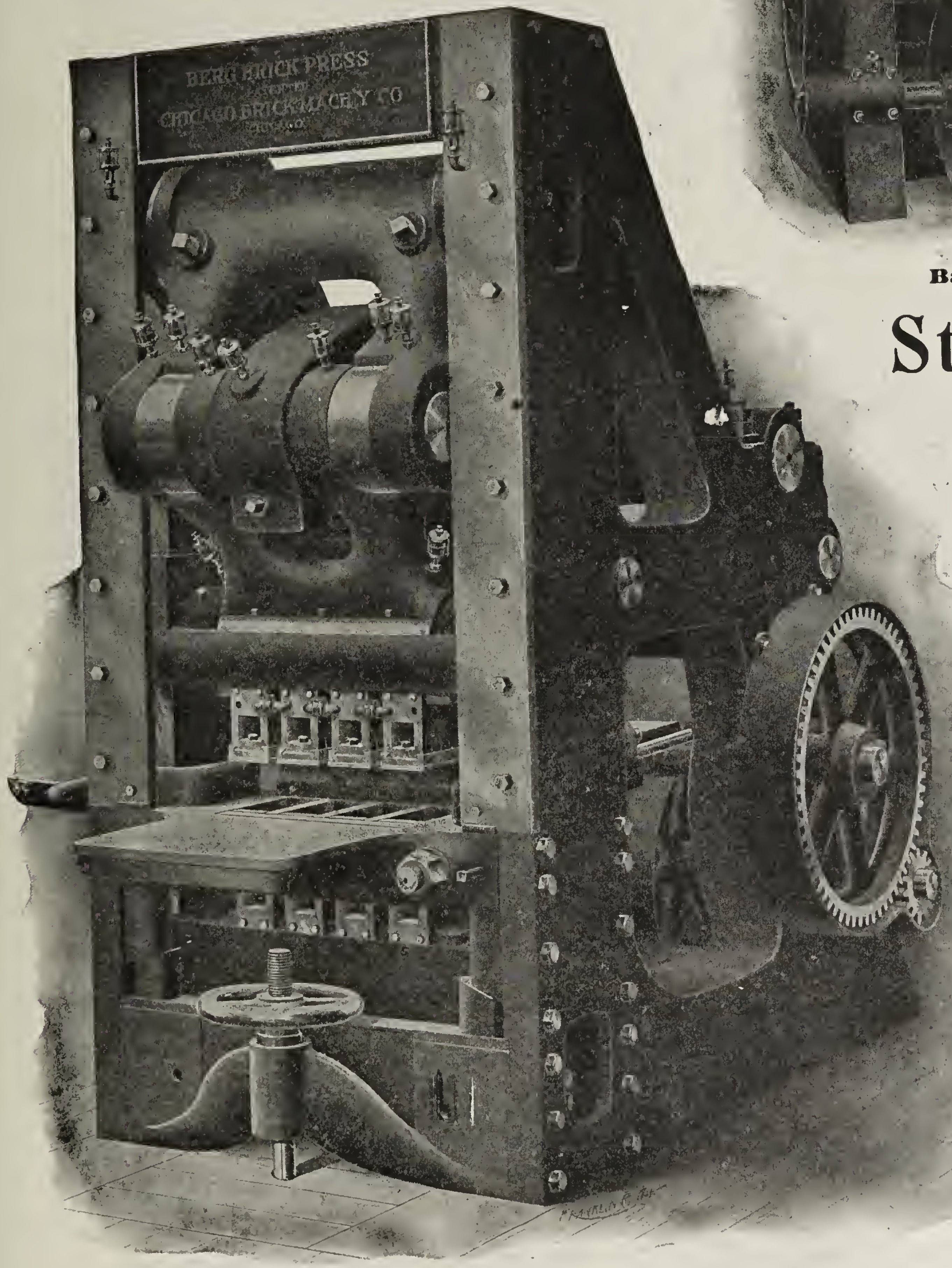
Still in the Lead

AND

One Step Further Forward



Even stronger than ever and all self-contained. Greater pressure and fewer working parts than any other machine. Simple, massive, compact. Running mechanism placed in rear, as shown in upper cut, enabling this machine to be SHIPPED IN ONE PIECE.

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CHICAGO BRICK MACHINERY COMPANY
77 Jackson Boulevard, Chicago.

The Boyd Brick Press

Built in the following sizes:

	CAPACITY PER HOUR
Two-Mold	1,000 brick
Three-Mold	1,500 brick
Four-Mold	2,000 brick
Six-Mold	3,000 brick

Write for
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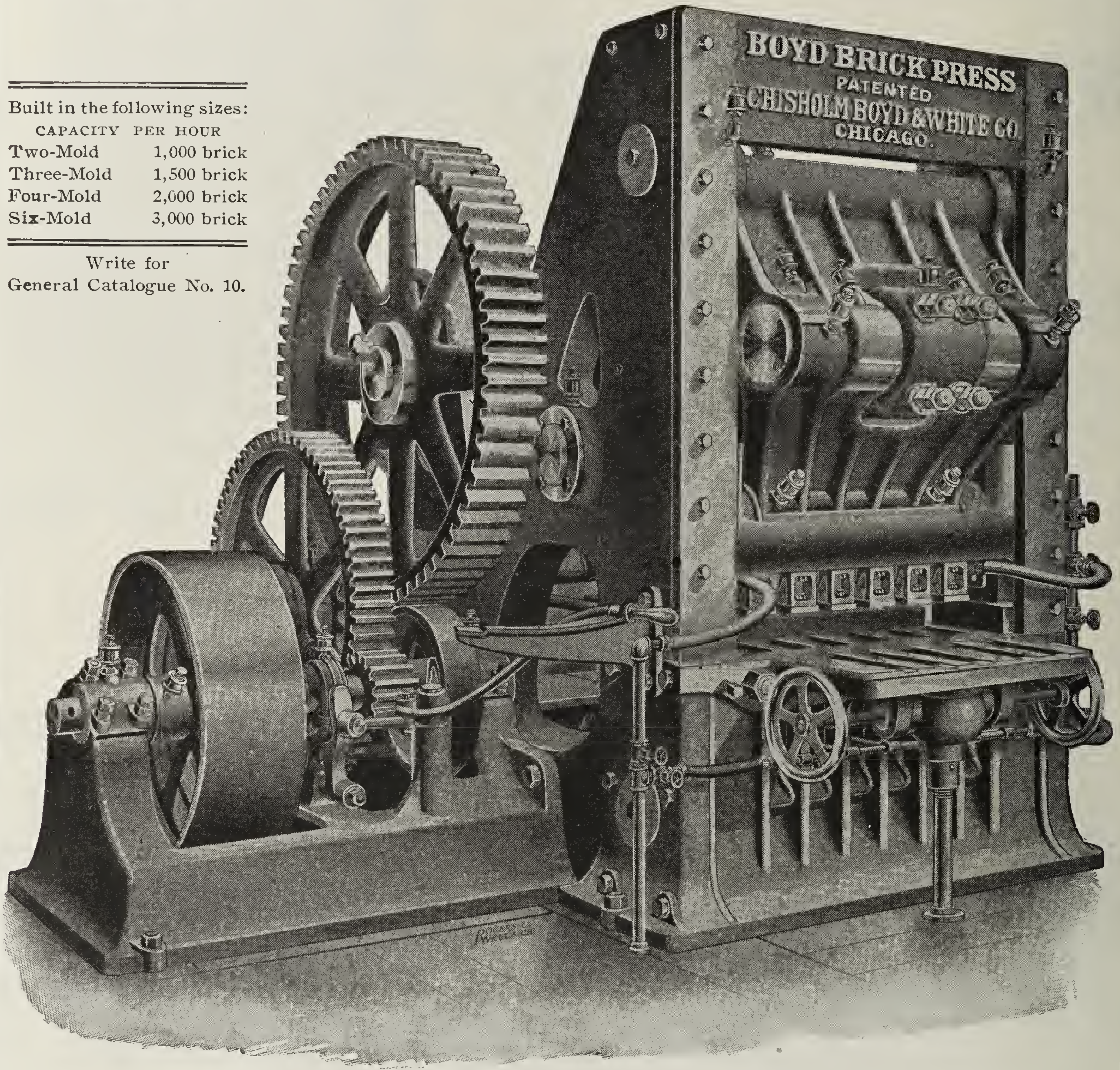

Another Record for the Boyd Press:

Six of our SIX-MOLD PRESSES in use on ONE YARD since 1892. Average cost of repairs for each machine One Dollar per year.

THE BOYD PRESS has always been distinguished for originality in design and construction. It will make better brick from clay or shale than can be made from the same material by any other press. It is selected and purchased by the most progressive Brick Makers. The largest and most successful brick plants in the country are using Boyd Presses.

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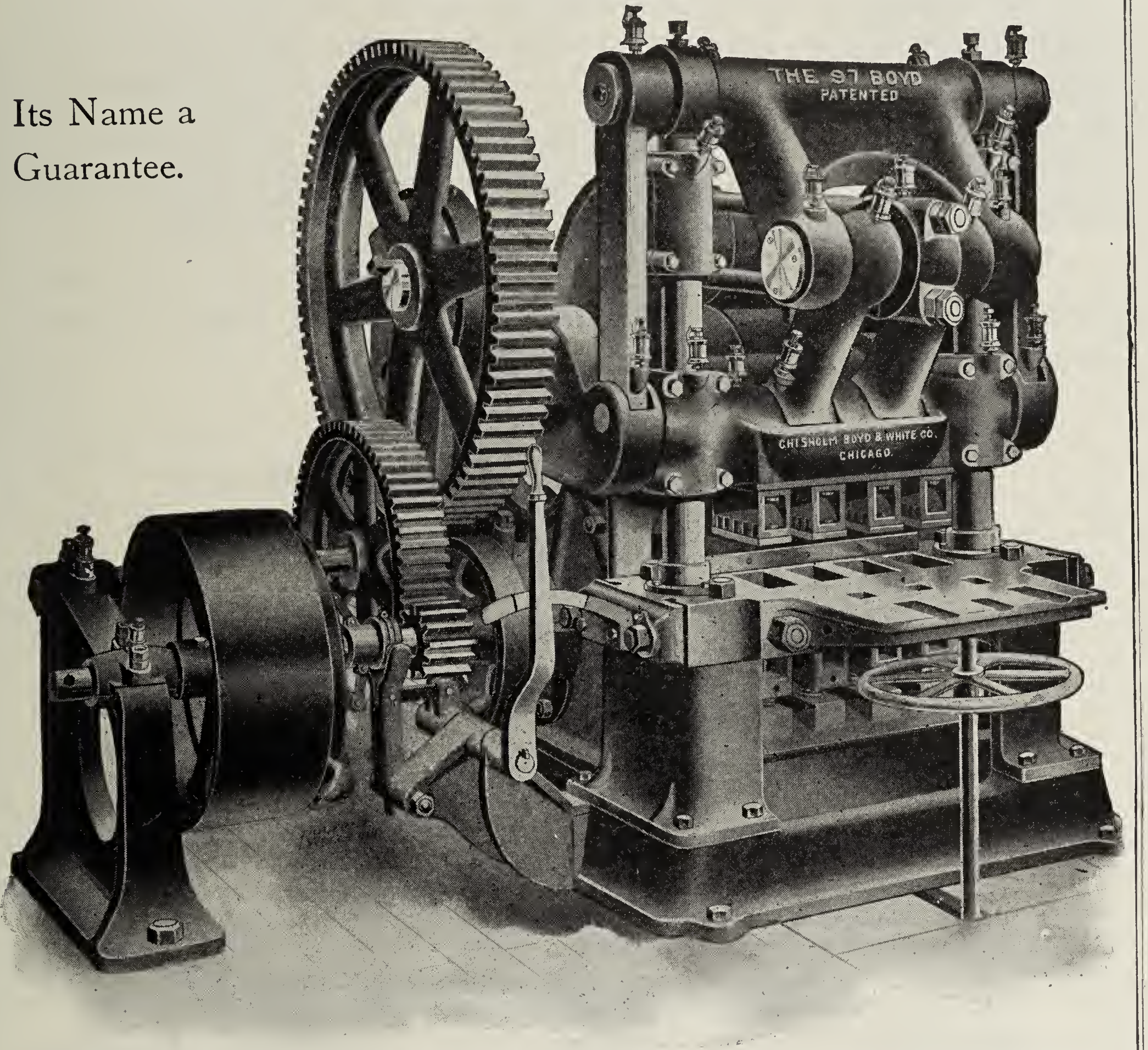
The Boyd Brick Press

The '97 Model

Its Name a
Guarantee.



THE '97 MODEL BOYD BRICK PRESS has enormous strength and great durability; it is compact; the adjustments are convenient; it operates quietly and smoothly; the workmanship and material are of the best; the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking.

THE BOYD is the only Brick Press provided with an independent adjusting device for regulating the amount of clay in the molds and the pressure on the brick. This feature positively ensures equal pressure and finish on both sides of the brick, and no granulated or soft centers.

Sent on trial and fully guaranteed. Seventy presses of this pattern now in use. Cannot be broken in pressing brick. Write for descriptive catalogue No. 9.

Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. **CHICAGO, ILL.**

BRICKMAKERS:

The proof of every pudding is in the eating of it. Below are some remarks from one who has tried the pudding recently. We can produce much similar testimony from those whose experience stretches over a long period of years.

This is the age of great achievements, and in the field of Brick Press development we claim to lead them all.

Write for our catalog and let us tell you why the Ross-Keller is better for pressing Clay or Shale or Sand-Lime or Cement than any other.

VISTA HERMOSA
SUGAR AND MERCANTILE COMPANY
SUITE 1018 ASHLAND BLOCK
CHICAGO
Works at Vista Hermosa, Mexico

March 24, 1905.

Ross-Keller Triple Pressure
Brick Machine Co., St. Louis, Mo.

Gentlemen--We are pleased to inform you that the erection of our brick plant is now complete, and the Ross-Keller Press which we purchased of you is in good running order.

This Press is making the most beautiful brick we ever saw, and is giving us splendid satisfaction. We are more than pleased with the machine and can conscientiously recommend it to any one who is looking for a first-class, up-to-date Press.

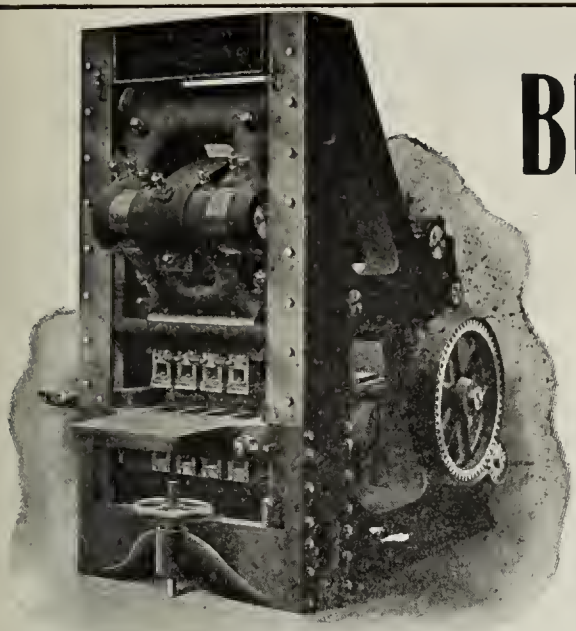
We can see ahead of us a demand and a place for all the brick that we can make on the Ross-Keller, and the outlook for our brick enterprise is exceedingly promising.

With good wishes for your success, we beg to remain,

Yours very truly,
VISTA HERMOSA SUGAR & MERCANTILE CO.,
By DeWitt C. Bovee, Pres.

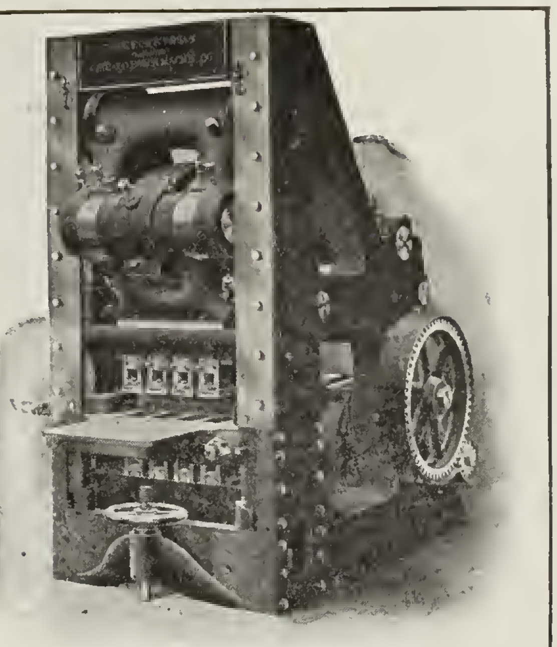
For prices and particulars address

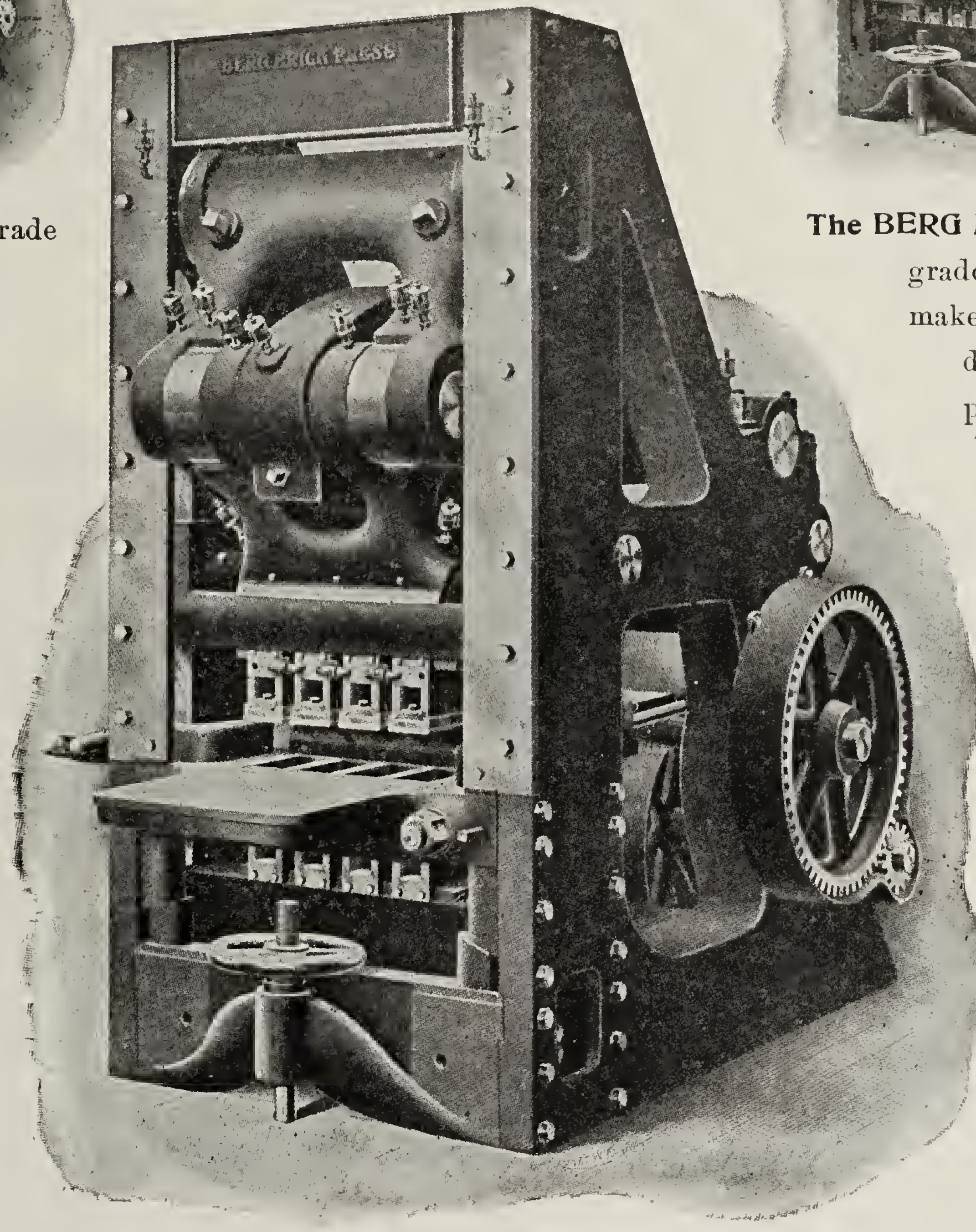
Ross-Keller Triple Pressure Brick Machine Co.
Fullerton Bldg., St. Louis, Mo., U. S. A.



BERG BRICK PRESS

The highest development of the Art of Brickmaking Machinery so pronounced by the United States Government.





The BERG for the highest grade of pressed brick of shale or clay. It makes all kinds of shapes and sizes of brick. Changes from one shape to another can be made in less than an hour's time.

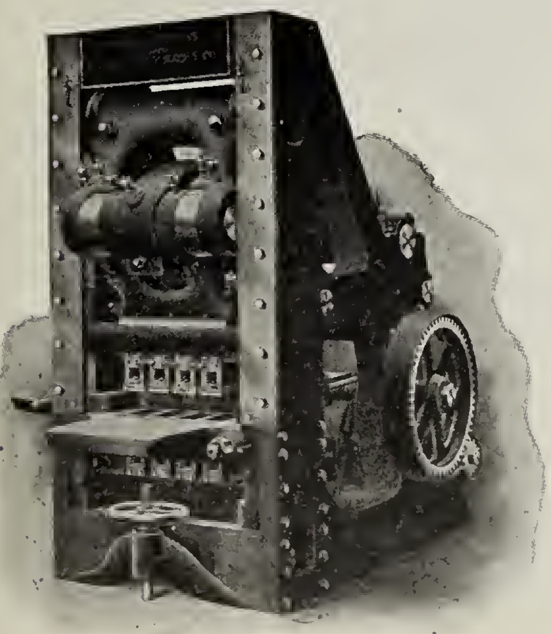
First-Class Workmanship. Cut Gearing. Fully Warranted.

The BERG makes the best sand-lime brick and cheapest because it is the strongest machine and gives the highest pressure. Thirty-five sand-lime plants in United States use the **BERG** Brick Press SUCCESSFULLY.

The BERG MAKES the highest grade of fire brick. Can make all kinds of shapes desired for fire-brick purposes.

Three distinct pressures make the brick evenly pressed all through. No granulated centers of the brick.

The BERG is the best for sand and cement because of its strong pressure. Uses less cement, makes cheaper brick.

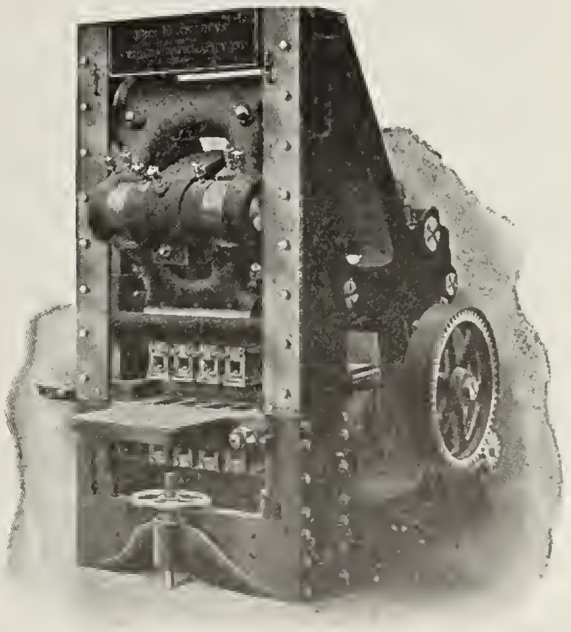


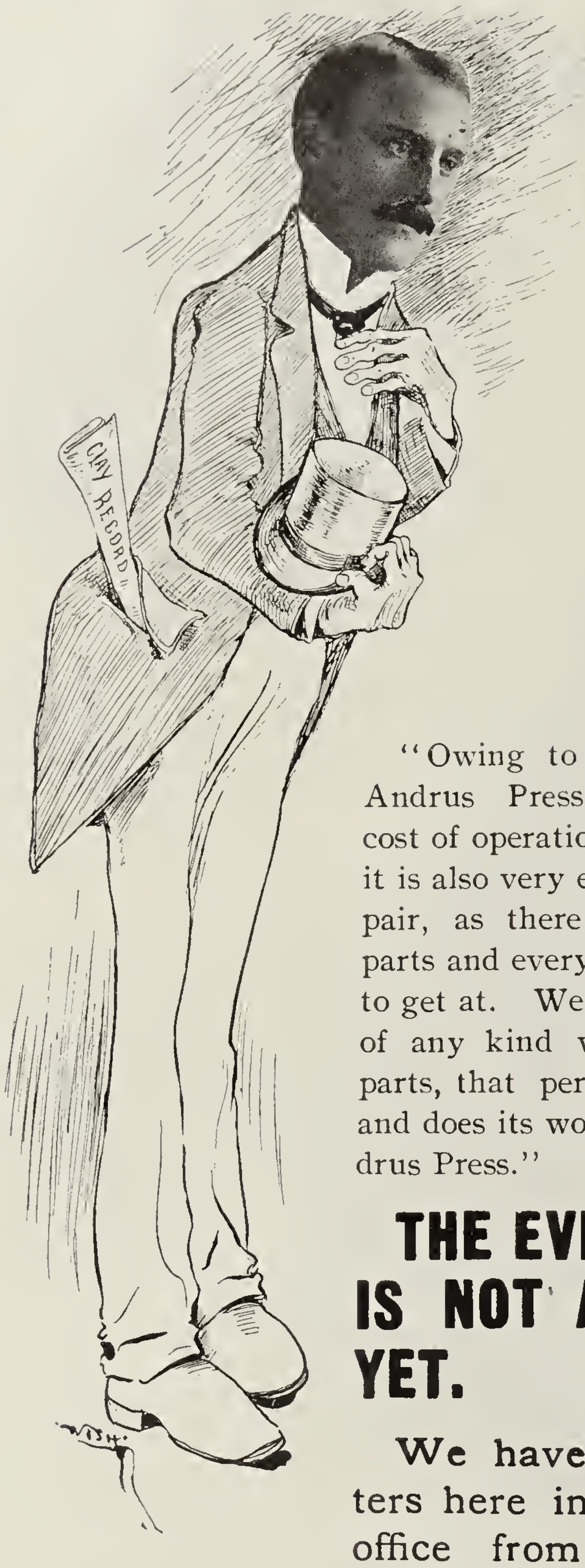
The 1905 Berg Press

Many other steps further forward in improvement and highest grade of material and workmanship, also cut gearing. Fully guaranteed as to its success. Manufactured by its inventor in Toronto, Canada, at the Bertram Engine Works Co. Plans and specifications on the different kinds of plants furnished, also all equipments.

For prices and full particulars, address

A. BERG
THE BERTRAM ENGINE WORKS
Toronto, Ontario, Canada





Even the Editor

Took Off His Hat

When We Cited the Following Instance:

Anthony Ittner Brick Company, with offices in the Odd Fellows Building, here in our city, have seven Andrus Presses on their yard at Bellville, Ill.

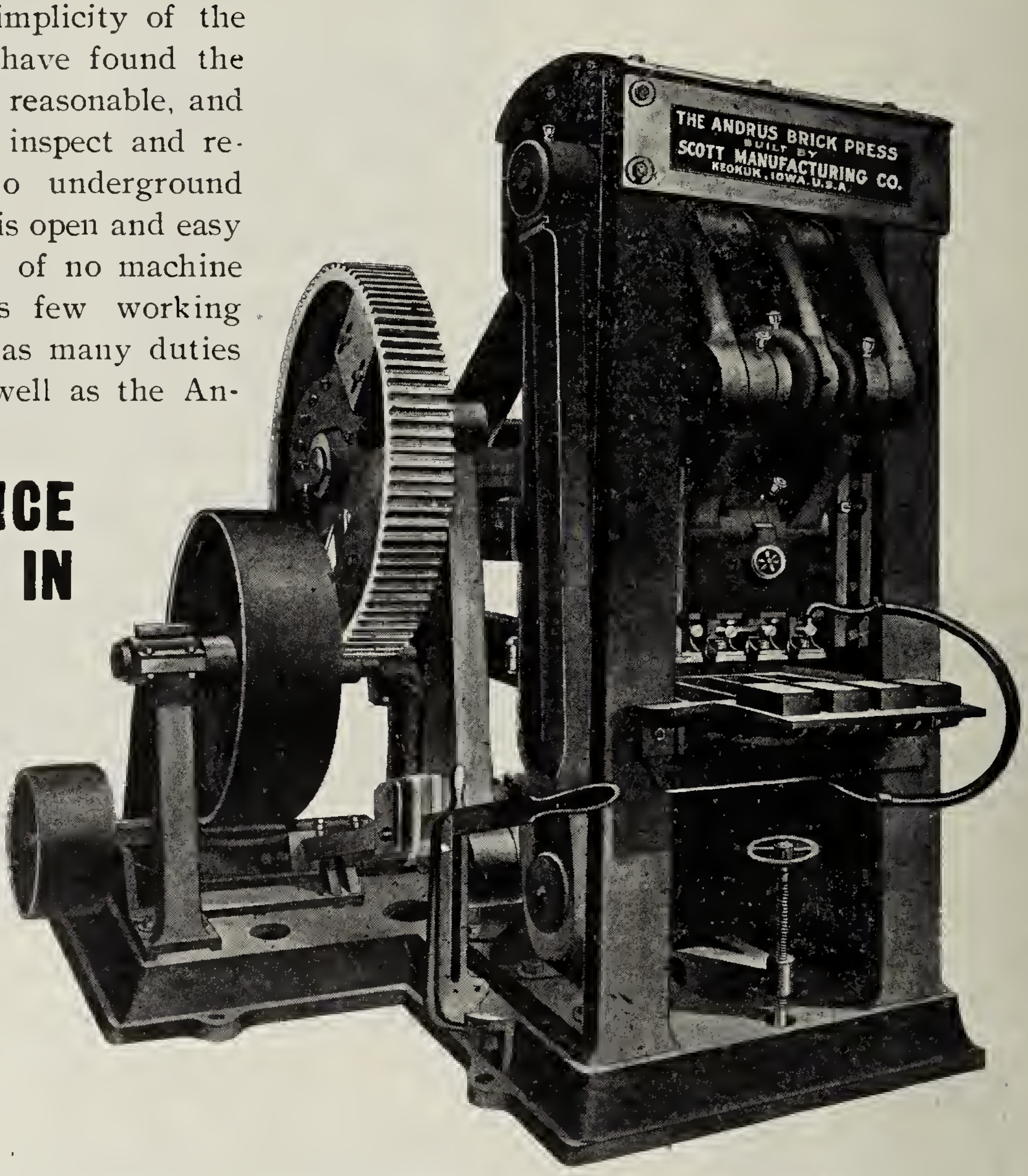
To show what they think of the machine illustrated below, we quote the following from their letter of recommendation:

> "Owing to the simplicity of the Andrus Press, we have found the cost of operation very reasonable, and it is also very easy to inspect and repair, as there are no underground parts and everything is open and easy to get at. We know of no machine of any kind with as few working parts, that performs as many duties and does its work as well as the Andrus Press."

THE EVIDENCE IS NOT ALL IN YET.

We have letters here in our office from almost every state in the Union, all of which corroborate the above statements.

In addition to letters of recommendation, we have eighteen Andrus Presses in the St. Louis district "making brick every day."



THIS IS THE PRESS THAT SCOTT BUILDS.

SCOTT MANUFACTURING COMPANY

WORKS:
Keokuk, Iowa.

Commonwealth Trust Building

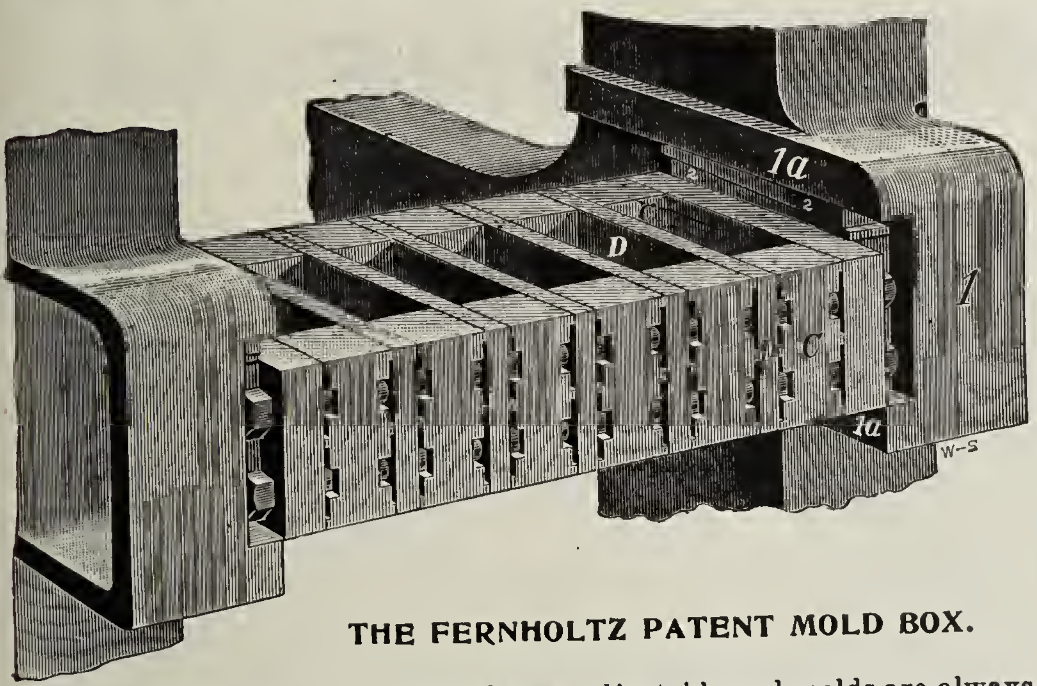
ST. LOUIS, MO.

THE FERNHOLTZ BRICK MACHINERY CO.

Manufacturers of

The Celebrated Fernholtz Dry Press

Four mold Press 20,000 daily capacity. Six mold Press 30,000 daily capacity



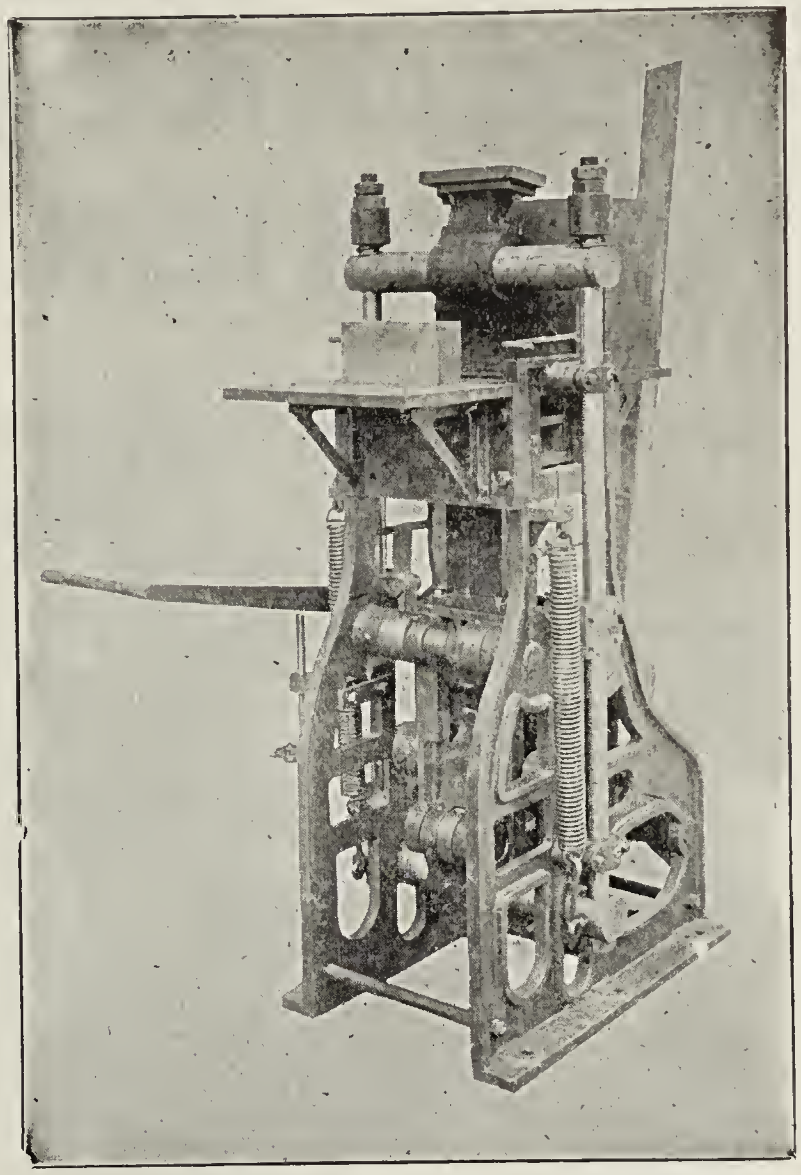
THE FERNHOLTZ PATENT MOLD BOX.

No old style Liners. The Blocks are adjustable and molds are always one size. We have put them in most all makes of Dry Press machines. Easily and quickly adjusted. They are made entirely out of chilled iron, the hardest known metal.

GRATH PATENT HAND POWER PRESS.

Especially adapted for ornamental designs Any size brick up to 12⅝ inches long, 10 inches wide and 4¼ inches thick.

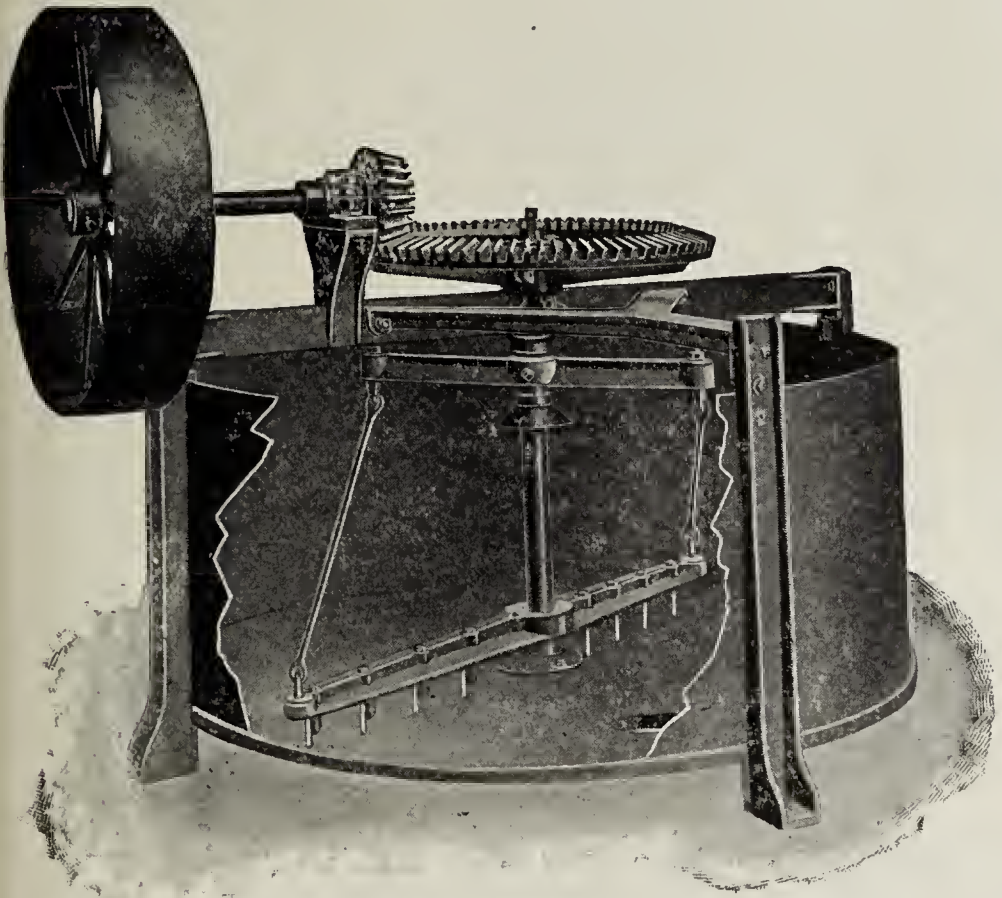
Brick set into kiln direct from press.



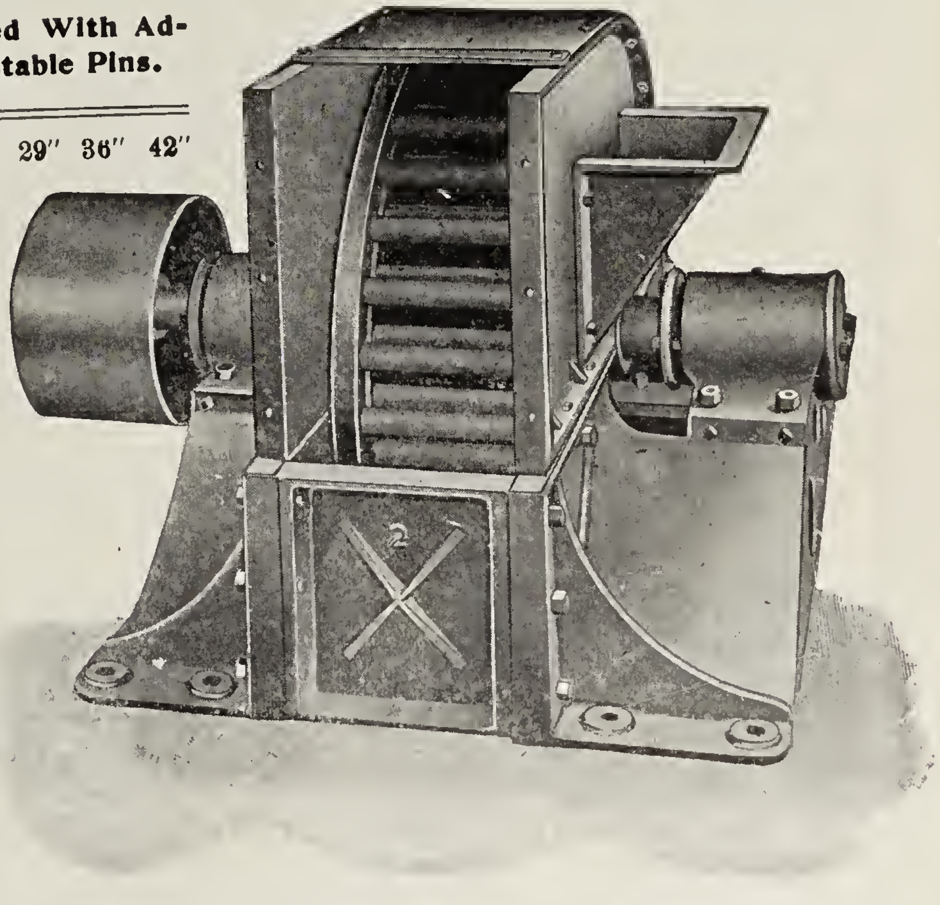
GRATH PATENT HAND POWER PRESS.

Fitted With Adjustable Pins.

Sizes 29″ 36″ 42″



A GOOD MIXER IS ALWAYS APPRECIATED.



THE FERNHOLTZ CLAY PULVERIZER.

The Fernholtz Brick Machinery Co.

Cable Address "Fernbrick." Western Union Code.

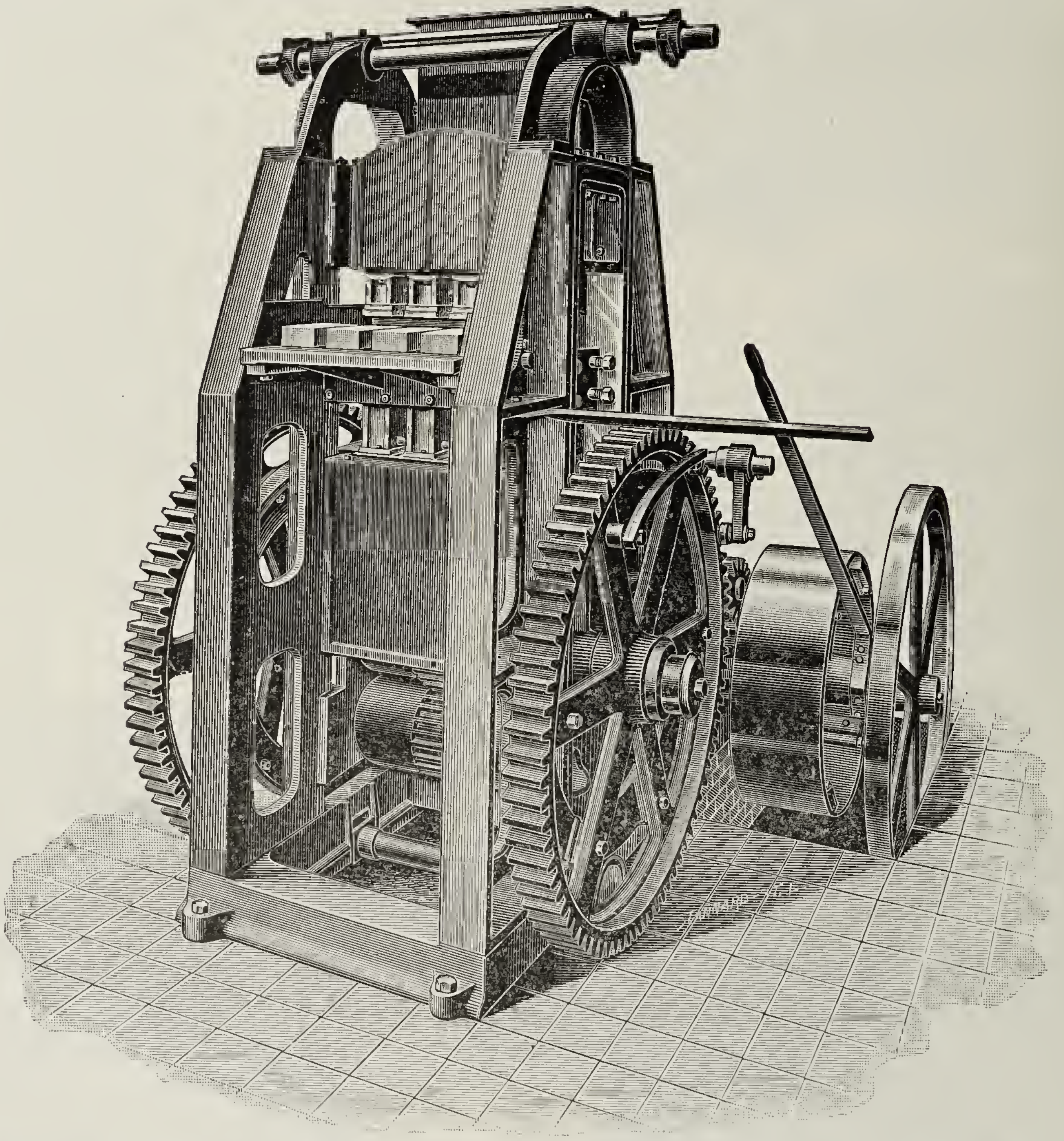
Boyle Avenue and Old Manchester Road, ST. LOUIS, MO., U. S. A.

PERFECTION REALIZED

IN THE

RELIANCE DRY PRESS BRICK MACHINE

(PATENTED)



Main
Features:
Strength
Durability
Simplicity
Saves Fuel
and
Costs Less

No
Toggles
No
Links
No
Pins
to
Wear

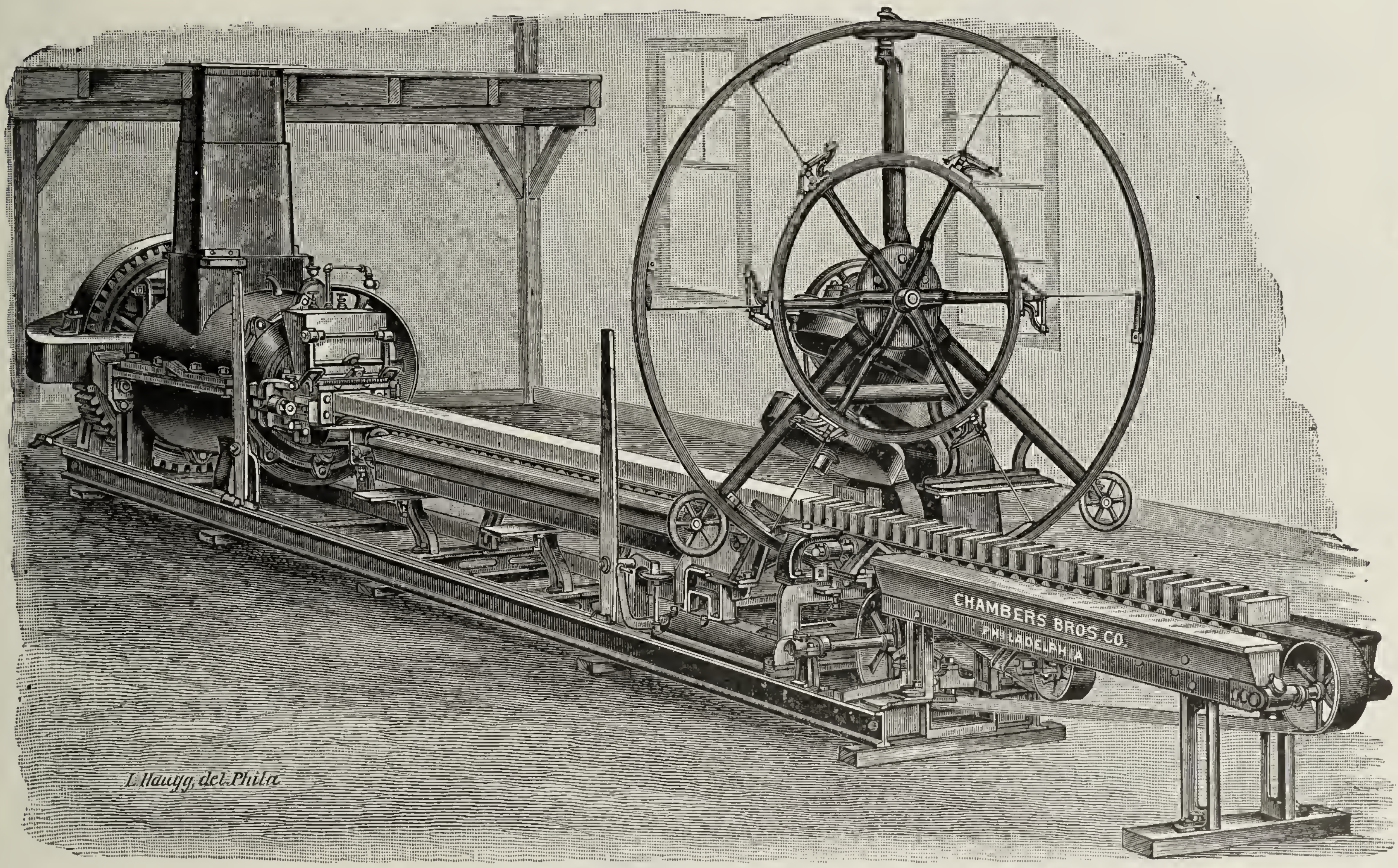
STRONGEST AND MOST POWERFUL BRICK PRESS ON THE MARKET

FOR PRICES AND FURTHER PARTICULARS ADDRESS THE

RELIANCE MACHINE AND TOOL WORKS
ST. LOUIS, MO.

MACHINERY FOR BUILDING BRICK
AND FOR STREET PAVERS

ROUND CORNER PAVING BRICK WITHOUT REPRESSING


CHAMBERS BROS CO.
PHILADELPHIA
L. Haugg, del. Phila.

THE CHAMBERS AUTOMATIC SIDE-CUT BRICK MACHINE.

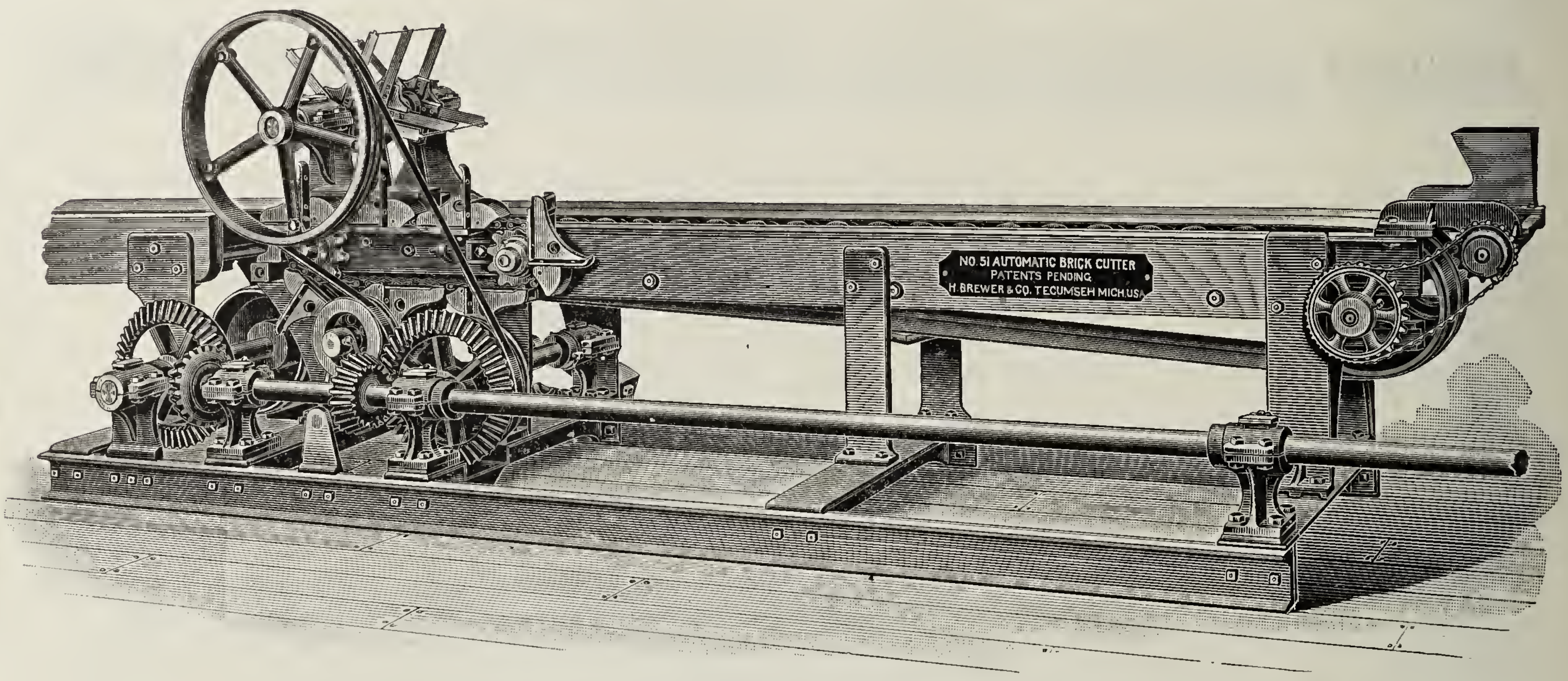
Automatic End Cut Brick Machines of five sizes, having capacity from 10,000 to over 100,000 brick daily under favorable conditions.

CHAMBERS BROTHERS COMPANY

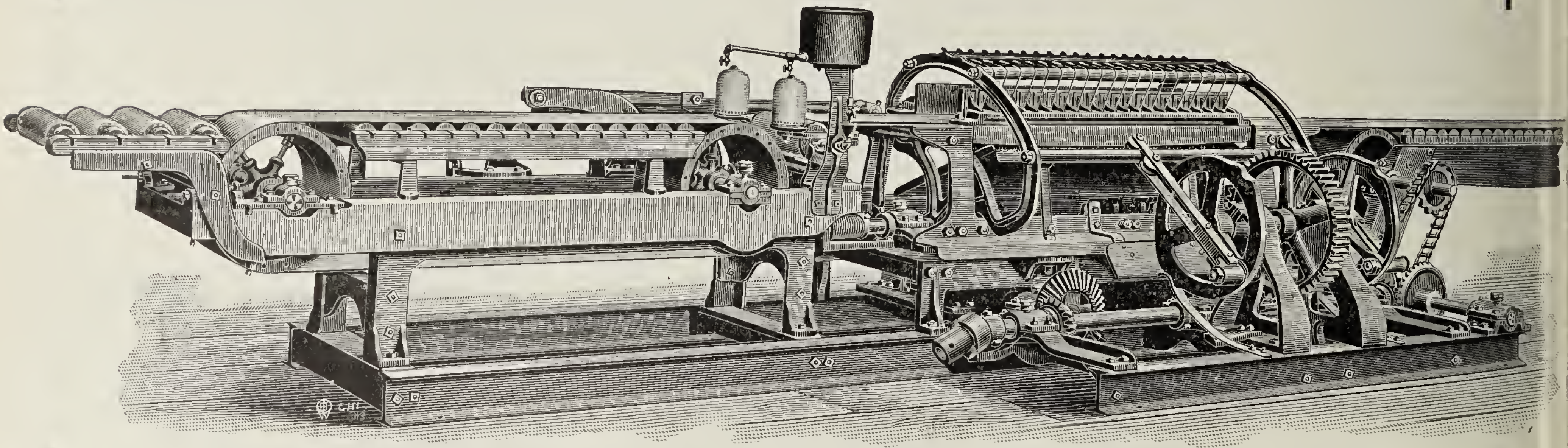
52D AND MEDIA STREETS
PHILADELPHIA, PA.

E. R. FRAZIER, Chicago Agent,
59 West Jackson Boulevard.

Cutting Machines

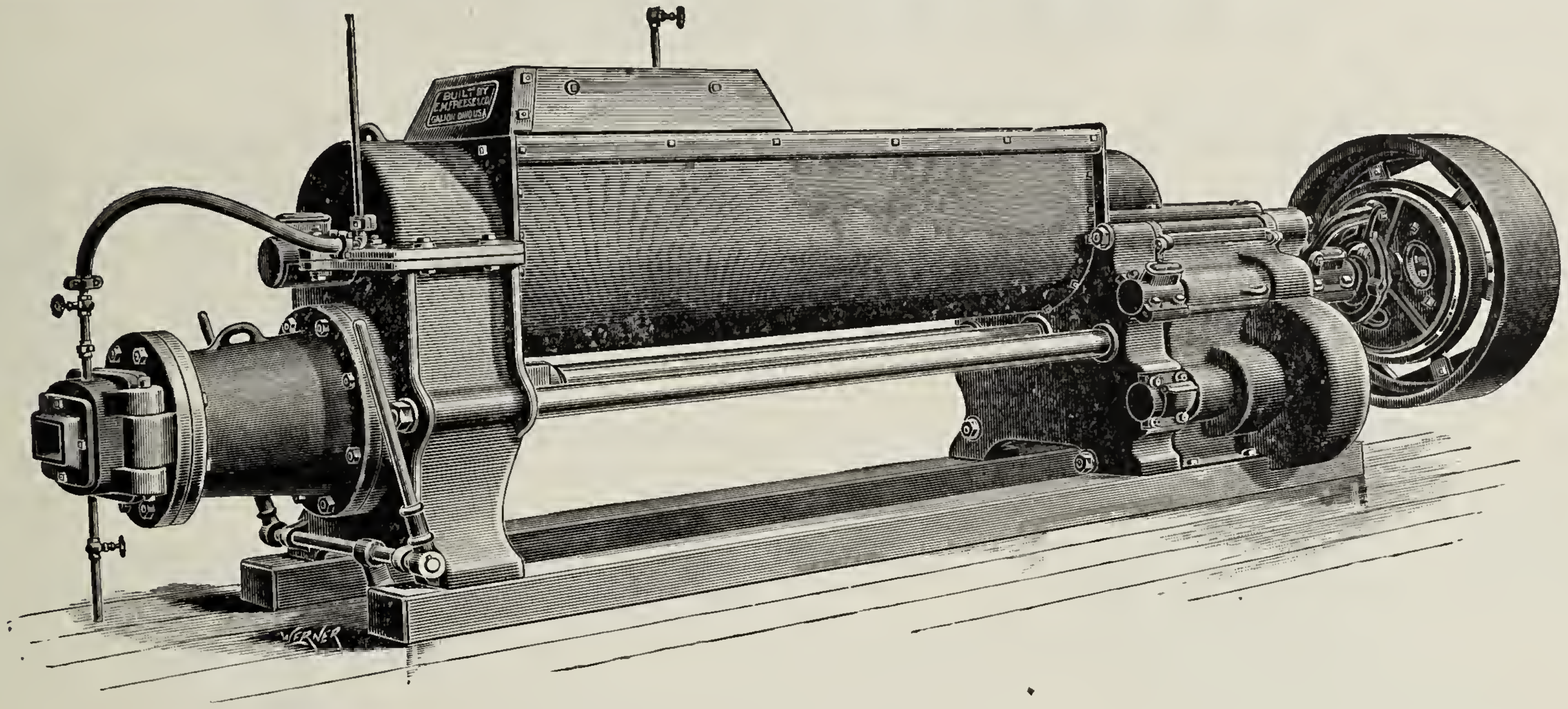

NO. 51 AUTOMATIC BRICK CUTTER
PATENTS PENDING
H. BREWER & CO. TECUMSEH MICH. U.S.A.

The Brewer line of Automatic Clay Cutting Machines is complete, embracing numerous desirable features of strength and simplicity of design, which the modern clay worker appreciates. They are all good machines in every sense of the word. Built from good material by good workmen. Sold by good, honorable methods and covered by good guarantees. There is nothing better. Tell us your cutting requirements and we will tell you what we will guarantee to do for you.



H. BREWER & CO., **TECUMSEH, MICHIGAN.**

UNION BRICK MACHINES



We build these Machines in five sizes. Capacities to 10,000 brick per hour.

Several hundred are in everyday use. They do first-class work and are convenient, economical and durable. This can be verified by investigation.

We also build Brick Machines with separate Pug Mill.

Don't forget our Automatic Cutters. **They give satisfaction.**

State your requirements and let us furnish particulars.

E. M. FREESE & CO.

GALION - - - - OHIO

LAMINATION is the source of more loss, more worry and more anxiety than all other troubles of a brickmaker

---

KENTON C READ, Pres. ANDY O'CONNELL, Vice Pres. and Gen'l Mgr C. M. MILLER, Sec.-Treas.

THE

C. M. Miller Mfg. and Mining Co. Inc.

MAKERS OF

High Grade Veneer and Building Brick

Office, 331 Ohio Street.

New Phone 1142.

Terre Haute, Ind. Dec. 22. *190*4.

Mr. H. L. Hix, Mgr.
The Wallace Mfg. Co., Frankfort, Ind.:

Dear Sir—I feel that I must tell you my experience with the brick made on the Intermediate Wonder:—

A few days ago a very prominent contractor asked me to bring him some samples of our brick. I fixed up some samples and started to his place, and just as soon as he saw them, he said: "I don't want them—they are no good; I would not lay one of that kind of brick," but I begged him to look at them and tell me why he did not want them. He asked me if he could break one of them, and I said, "Yes, break all of them." So he took his hammer and hit one on the corner; then he looked up at me and said: "I never saw a stiff mud brick like that;" then he broke it all up, just as nice as any brick, and he said: "That is the first stiff mud brick I ever saw without lamination," and that they were all right.

We are now selling our brick as fast as we can deliver them.

Pardon me for taking your time, and with SUCCESS to the WONDER, I am,

Yours very truly,

Andy O'Connell
V P and Gen Mgr.

In the event that you want to make brick filled with LAMINATION, CRACKS and CROOKS, a Wonder Machine will not answer your purpose.

THE WALLACE MFG. CO.

FRANKFORT, IND., U. S. A.

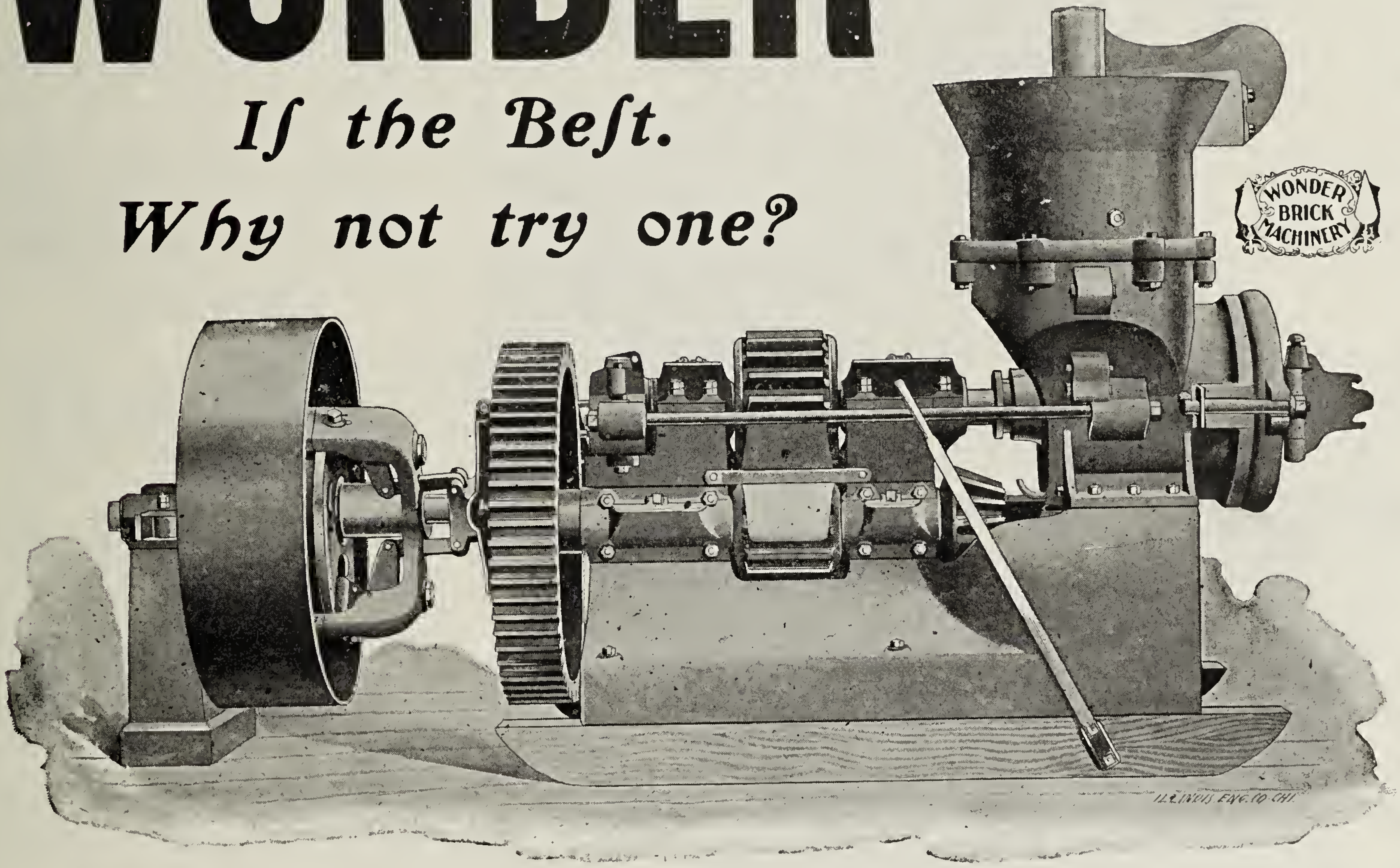
NO DOUBT ABOUT IT—

It is a Fact, conceded by every User, that the

WONDER

Iſ the Beſt.

Why not try one?

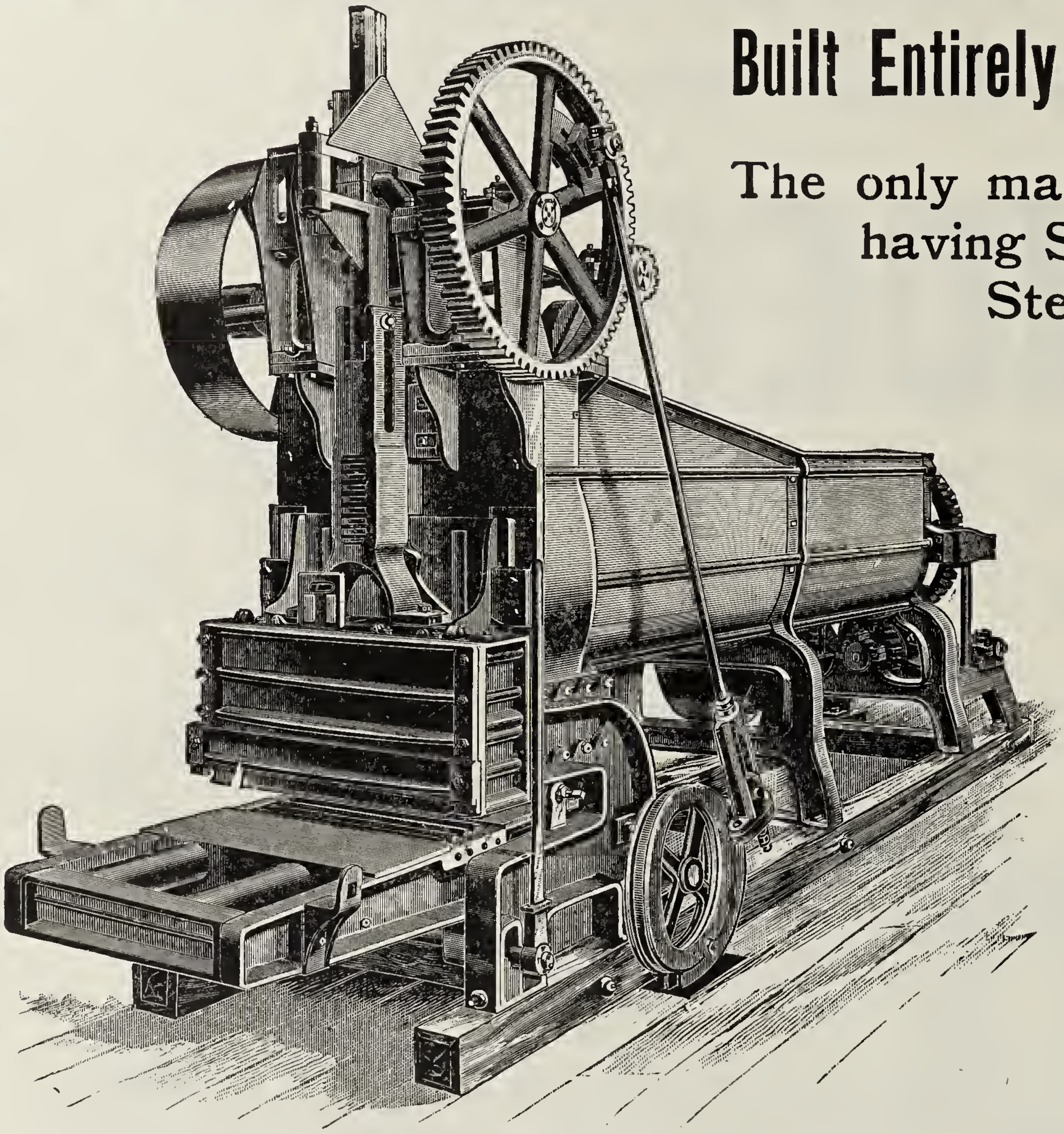


We Have the Best Roofing Tile Proposition ever offered to the trade.
Write Us: Let us tell you about it.

The Wallace Mfg. Co.

FRANKFORT, IND., U. S. A.

THE POTTS HORIZONTAL BRICK MACHINE



Built Entirely of Iron and Steel.

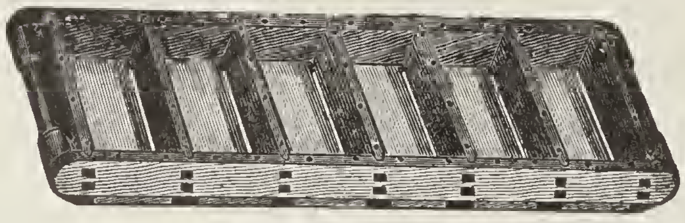
The only machine of this class having Steel Gear and Steel Shaft.

Built of the Best Material by the Best Workmen.

Simple, Strong and Durable.

No extra pug mill required to enable working the clay direct from the bank. Its great strength enables working the clay as stiff as practicable, insuring brick which will be STRAIGHT and SQUARE.

THE LEADER OF ALL SAND MOULD MACHINES.



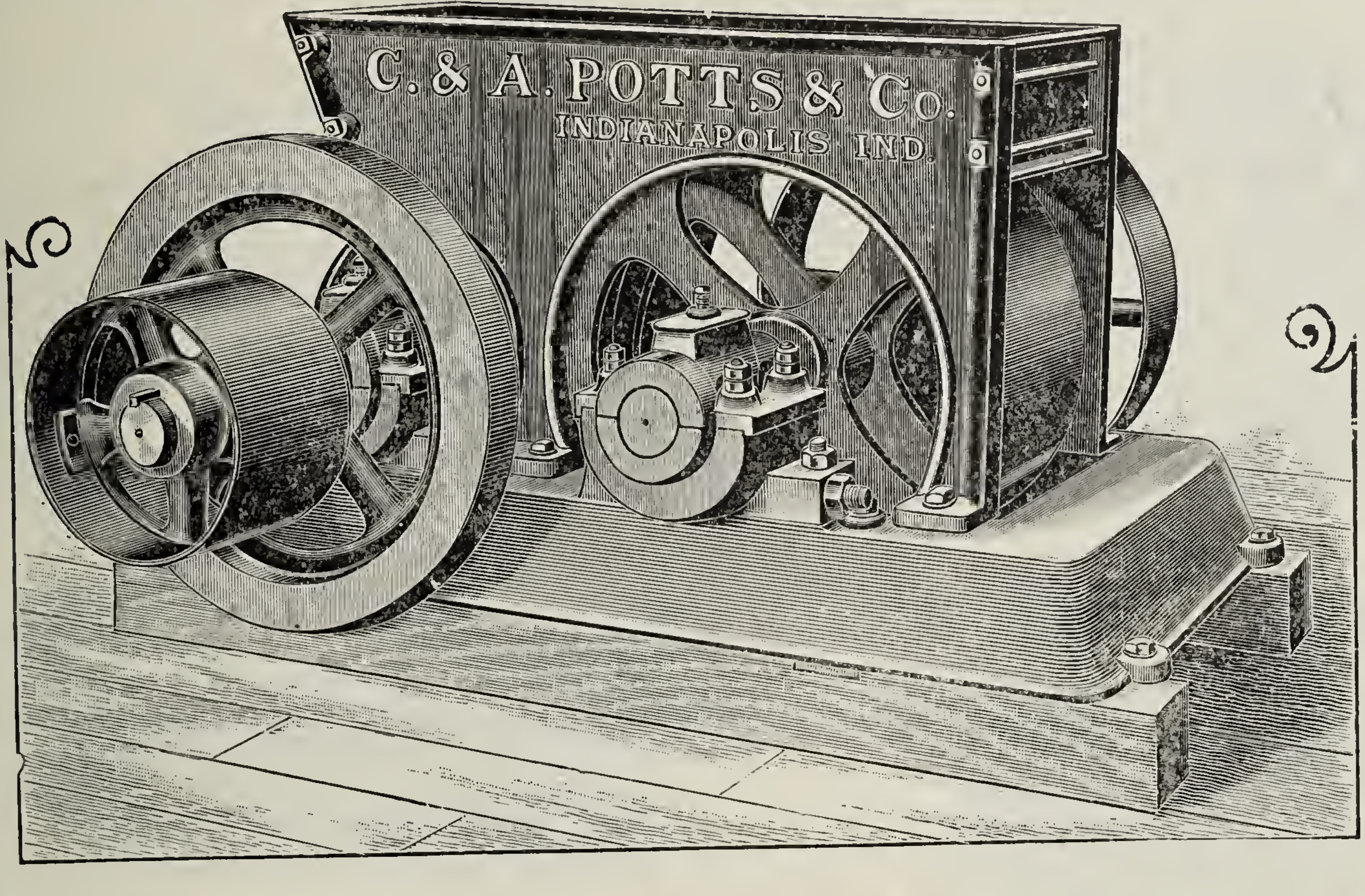
BRICK MOULDS A SPECIALTY

QUALITY IS OUR AIM.

We manufacture a complete line of Brick Yard Supplies. Write for prices.

C. & A. POTTS & CO., Indianapolis, Ind.

THE POTTS DISINTEGRATOR


C. & A. POTTS & Co.
INDIANAPOLIS IND.

Is not a spite machine, but is built the best possible. Having Heavy Chilled Rolls, Ring Oiling Bearings, Shafts of Steel and large in Diameter. The most successful machine for grinding out sticky clays and separating the stone.

THE POTTS MOULD SANDER

Simple in Construction,

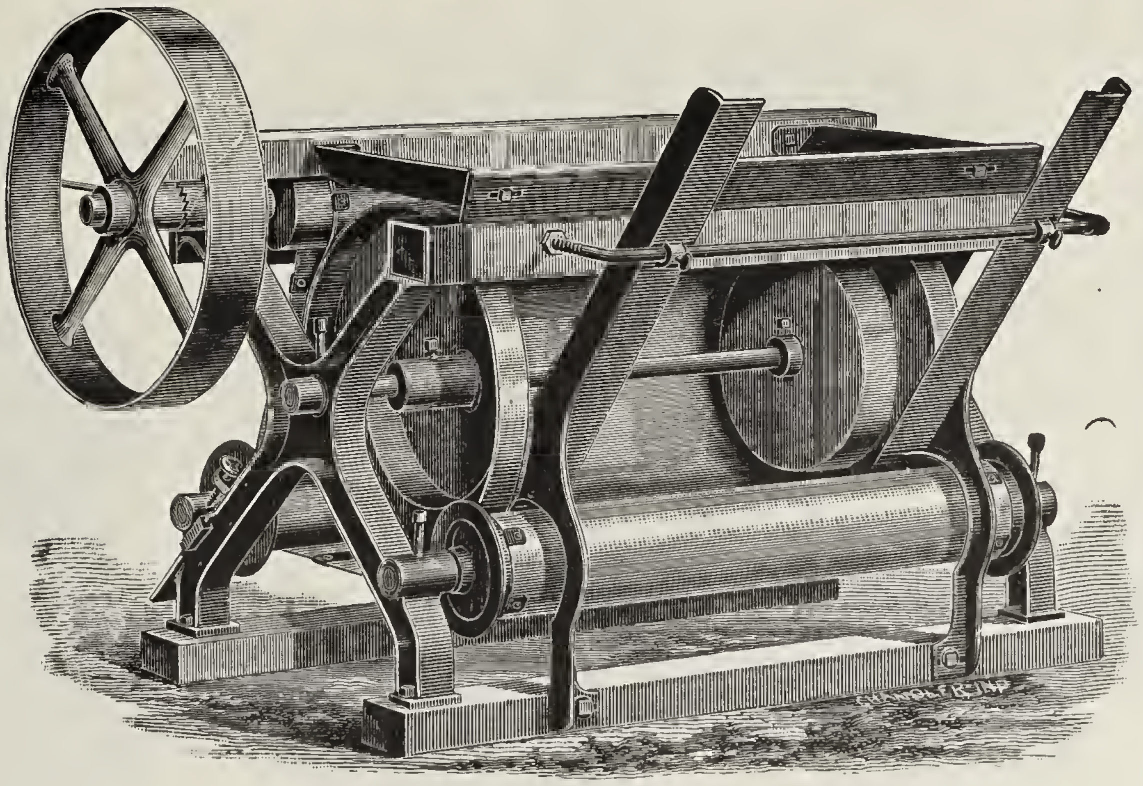
Strong and Durable,

Sands the Moulds Perfectly,

Never Strikes or gets Drunk,

Always Ready for Work,

No Brick Machine Complete without this Machine.



Patented February 5, 1889.

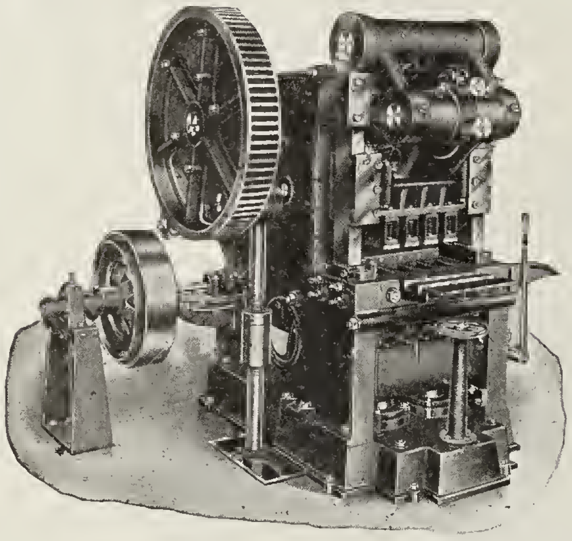
We make a specialty of equipping Sand Mould plants complete. We are the largest manufacturers of this class of machinery in the world. Write for prices.

C. & A. POTTS & CO., Indianaoplis, Ind.

Built Right Run Right

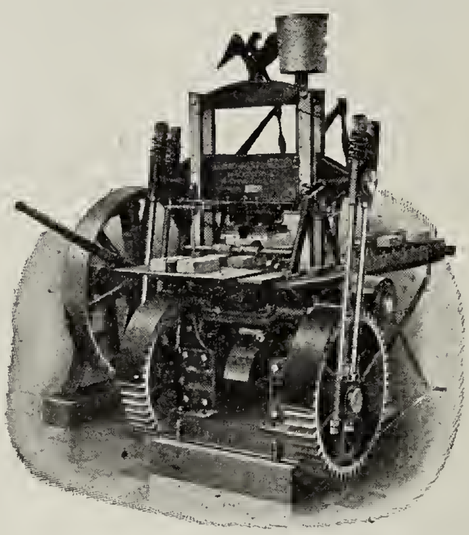
The American Clay Machinery

These are a few of the many Superior machines we manufacture for the Clay Trade. Large cuts



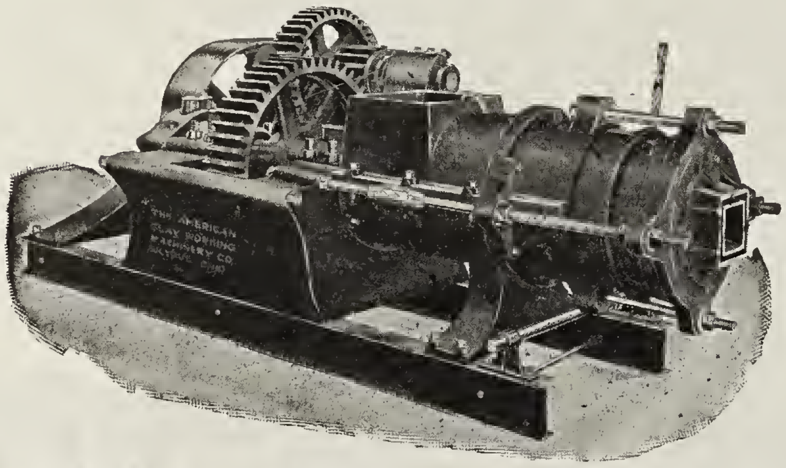
DRY PRESS BRICK MACHINERY.

We build a full line of Dry Press brick machinery. We have four styles and eight sizes, ranging in capacity from 1,000 to 3,000 brick per hour. This cut is our four mold, Moldel B press, especially adapted to Sand-Lime brick. Write for complete catalogue.

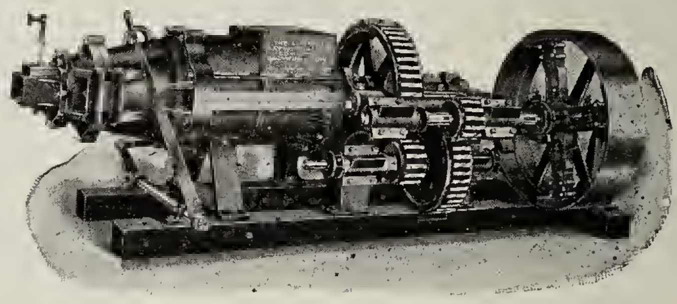


REPRESSES.

We build a large and complete line of represses in six sizes and styles. Capacity runs from 600 to 2,500 brick per hour. Send for our complete catalogue. This cut is of our double mold Eagle Repress.

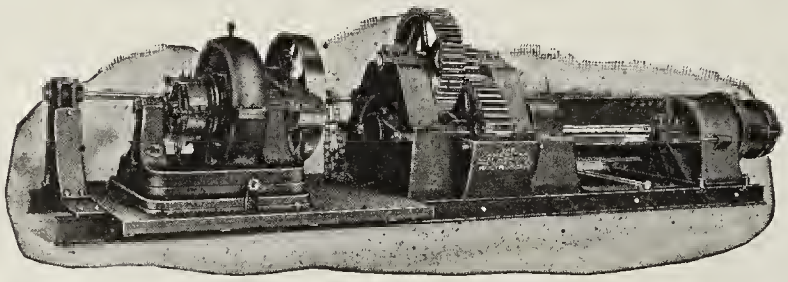


No. 40 AUGUR MACHINE FOR HOLLOW WARE.



No. 2 GIANT AUGER BRICK MACHINE.

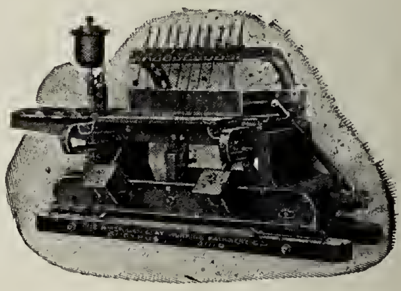
We build ten sizes and styles of Auger Machines. Capacities 1,500 to 10,000 brick per hour. Write for complete list.

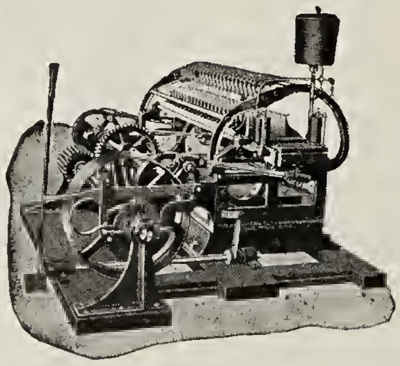


No. 23 ELECTRICAL DRIVEN, LOW FRAME, COMBINED MACHINE.

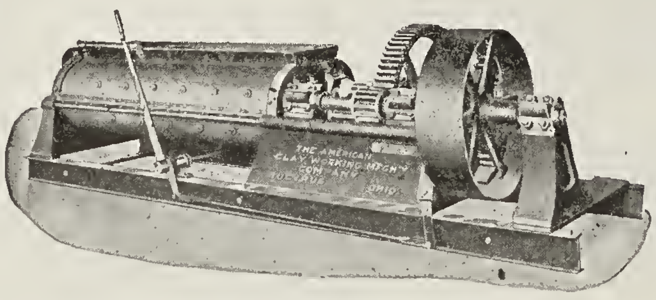
We make a full line of electrical driven clay-working machinery. Send for catalogue.

SEMI-AUTOMATIC AND HAND POWER CUTTERS





We make twenty-five styles of semi-automatic and hand power cutters for brick, tile and hollow ware. Write for full list and description.

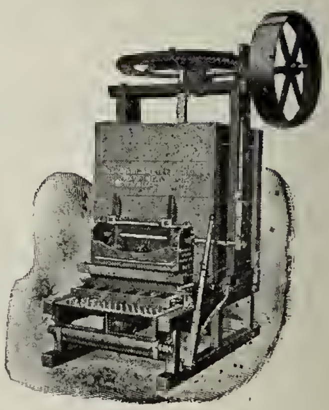


No. 38 DOUBLE SHAFT PUG MILL.

We build twenty different styles and sizes of pug mills to suit the needs of varying clays. Send for complete list and description.

SOFT MUD BRICK MACHINES.

Our Eagle Steam and Horse Power Brick Machines are the best built for small capacity. They are complete with molds, etc. Write for our soft mud booklet. These machines are especially adapted for export.



Built Right Run Right

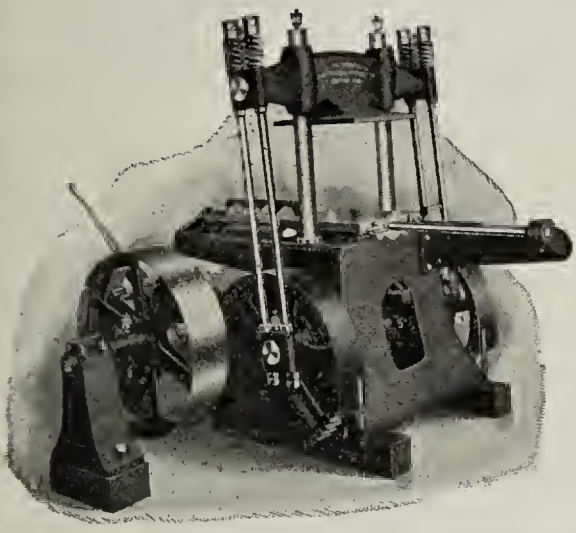
Dry Press, Stiff Mud and Soft Mud Brick Machinery. Sand-Lime Brick Machinery, Cement, and Pottery Machinery. Waste Heat and Steam Dryers

Everything needed by the Clay Workers.

Company, Bucyrus, Ohio, U. S. A.

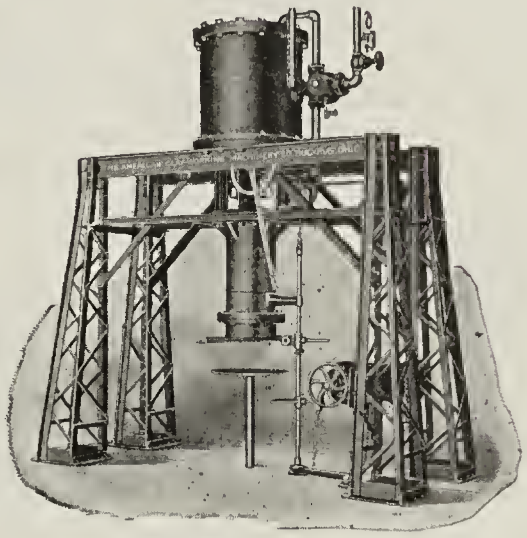
Built Right Run Right

and full descriptions of these and a hundred other machines we make will be sent upon request.



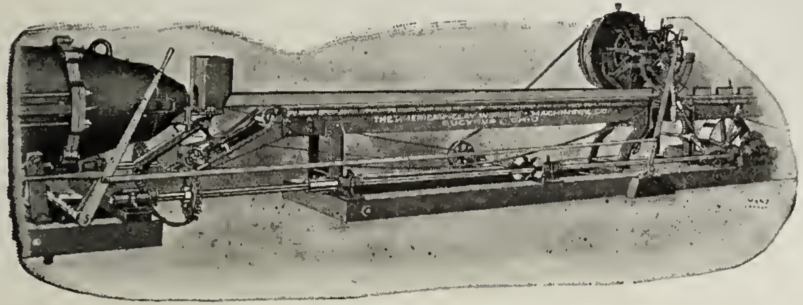
ROOFING TILE PRESS.

We build four styles of Roofing Tile Presses for the pressing of Hip Rolls, Crestings, etc. Write for complete description.



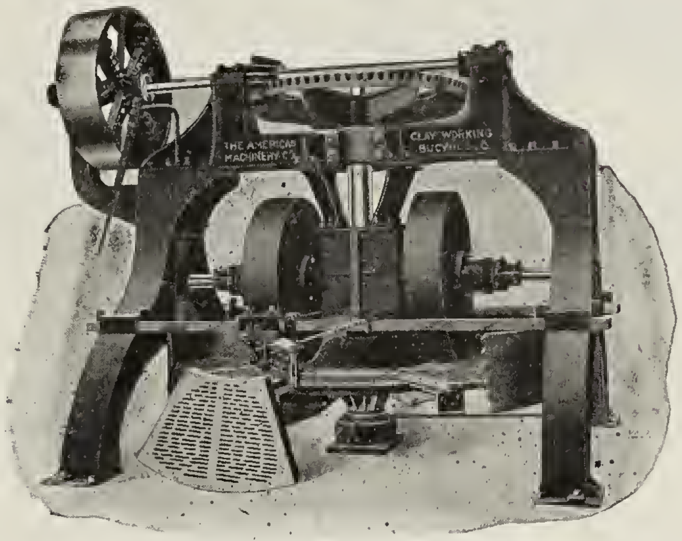
SEWER PIPE MACHINERY.

We build three styles of Sewer Pipe Presses, together with all appliances for a complete plant. Send for our big catalogue.



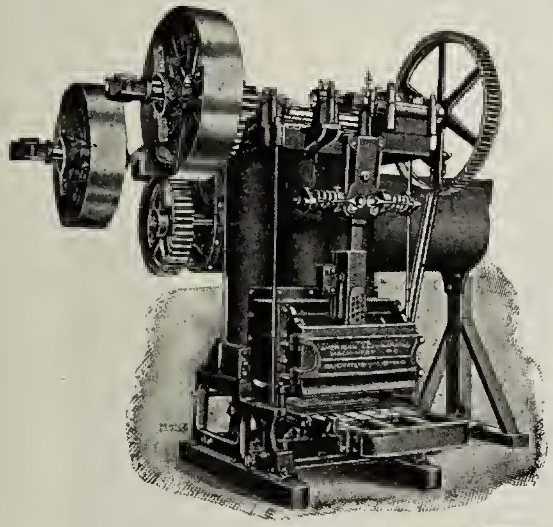
AUTOMATIC, END CUT, BRICK CUTTER, STYLE "P."

For end cut brick this machine is excellent. We build several styles of automatic cutting tables. Write for particulars.



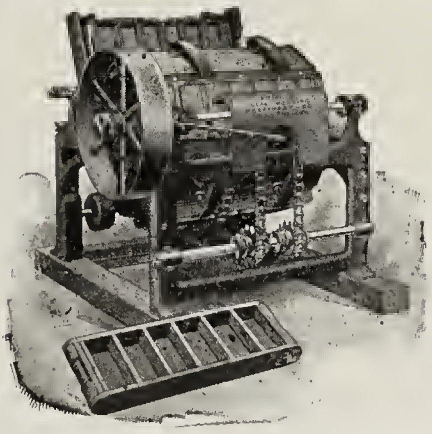
DRY AND WET PANS.

We build twenty styles of Dry and Wet Pans in varying capacity. They are all constructed of iron and steel and are most substantial. A complete description of the full line will be sent for the asking.



SAND MOLD BRICK MACHINE.

This machine is especially adapted for sand mold brick. It is an excellent machine. Write for a complete description.

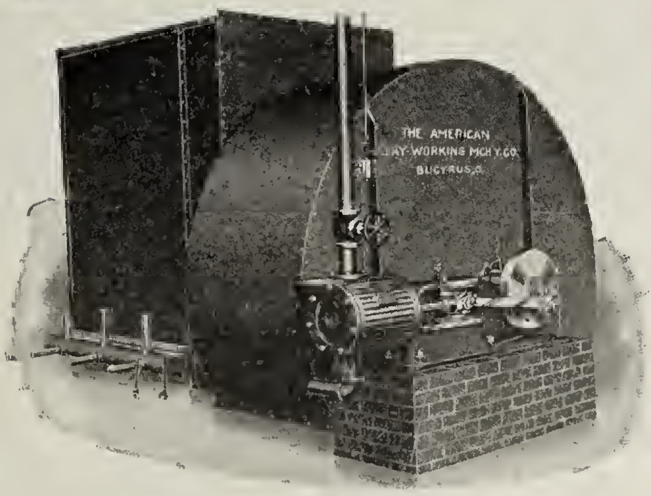


CHAMPION MOLD SANDER.

This is an excellent machine and sand molds evenly and economically. It is entirely automatic. Send for description.

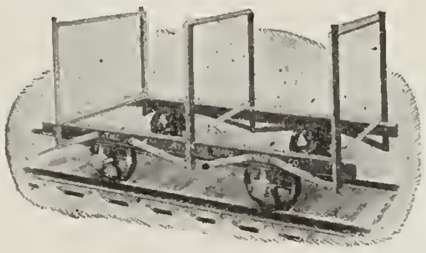
WASTE HEAT AND STEAM DRYERS.

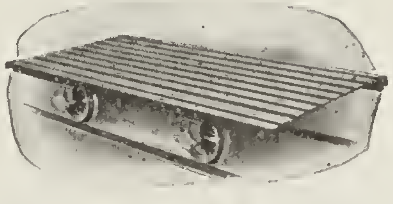
We build both waste heat and steam dryers and can dry the most tender clay. Plans and estimates furnished upon application. We can dry your product at one-half the present cost or less. The cut is of our waste heat dryer outfit.



OUR LINE OF CARS.

We build dry cars and clay dump cars in forty varieties. Send for car catalogue as it is sure to contain just what you want.





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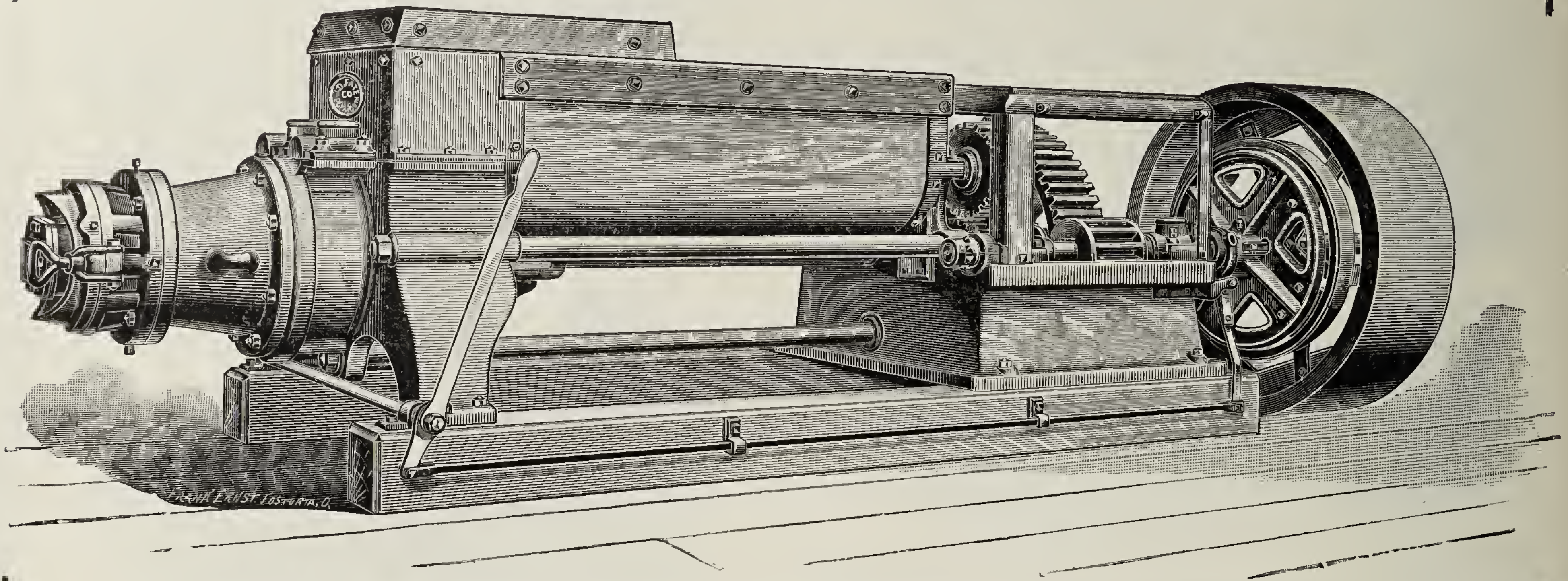
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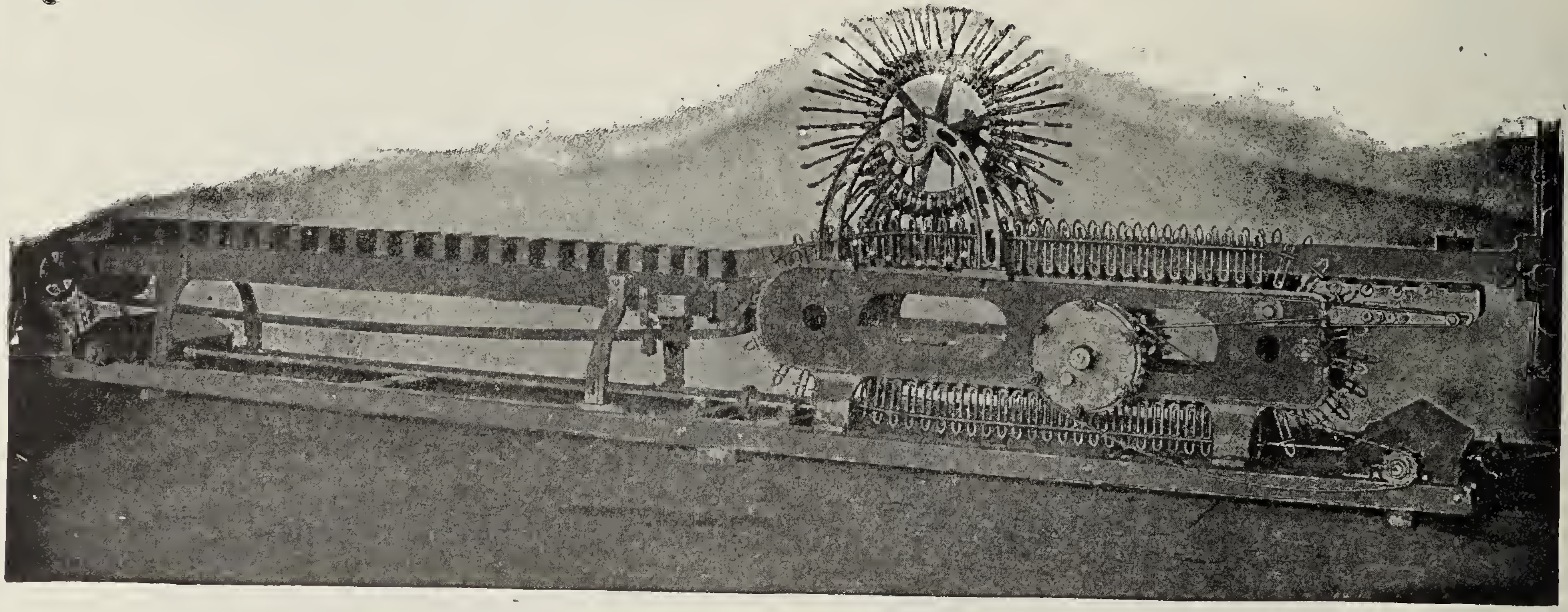

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CLAY RECORD

Vol. XXVI. No. 10. CHICAGO, MAY 31, 1905. Semi-Monthly, $1.00 per Year
Single Copies, - 10 Cents

SOME NON-METALLIC MATERIALS USED IN BUILDINGS AND OTHER CONSTRUCTIONS.

By E. R. Buckley, Ph. D., State Geologist of Missouri.

The most important constructional materials outside of wood and steel are stone, clay products, sand-lime brick, cement, concrete and plaster. Stone occurs in an almost infinite number of varieties, colors and tints varying greatly in composition and texture, and consequently in hardness, strength and durability. It is a natural building material and needs only to be quarried, cut and dressed before being used. In many places stone may be obtained at a very moderate cost, although in some localities it is rated among the most expensive of building materials. There is probably no material used that is so universally sought after for buildings and other constructions as stone. Were it not for the cost, most of the large buildings in our cities would be constructed out of granite. However, where ornamental designs are required, the expense of cutting and dressing makes its use almost prohibitive. Granite is everywhere taken as the standard of strength and durability among the non-metallic building materials. The manufacturer of building materials out of clay, cement or any other substance or substances, consciously or unconsciously, looks upon granite as the standard of strength and durability. In fact, it is not uncommon to hear the manufacturer of brick and terra cotta compare their products with granite.

Stone as it occurs in nature is variously colored and has strength, hardness and durability, but lacks shape and form. The raw materials used in the manufacture of brick, terra cotta and other building materials,—including clay, cement and sand,—have neither the required strength, durability, hardness, nor form. All of these qualities must be imparted to the material in the process of manufacturing.

The problem which confronts the manufacturer is to give strength, durability, hardness, shape and, frequently, color to his materials at a cost less than that required to quarry and give shape and form to strong and durable stone. In the case of stone, the materials are, first, hardened by nature and then given form and shape by man. In the case of the manufactured products, they are given shape and then hardened, both by man.

It has been demonstrated that for many purposes brick, terra cotta and other clay products are equally as well suited as the strongest and most durable stone. For some uses, especially in positions where the materials may be exposed to extreme heat, clay products are much superior to stone. The suitability of cement-concrete and sand-lime brick for use in some building constructions has also been well established.

All stone is not suitable for buildings. Some is weak and soft and consequently not durable. Likewise clay brick, sand-lime brick and cement-concrete, are frequently soft and fragile and unfit for building constructions.

Can equally as strong and durable products be made out of lime and sand, or cement, sand and crushed stone as out of clay, and can they be made at the same price? It is not difficult to answer the first question. Building materials can be manufactured out of lime and sand, or cement, sand and concrete, which, for some uses, are equal if not superior to clay products. On the other hand, it has thus far been impossible to manufacture out of any other materials a product so well adapted to certain other forms of building constructions as are those products manufactured out of clay. The second question, which is one of cost, depends upon several factors, some of which are as follows: (1) cost of raw material; (2) cost of labor; (3) cost of fuel; (4) interest on investment; (5) depreciation of plant.

There are so many grades of clay brick that it is difficult to compare the cost of manufacturing these with the cost of manufacturing sand-lime brick. The clay used in the manufacture of common building brick is usually obtained at or near the factory. Factories for the manufacture of sand-lime brick are usually located in close proximity to deposits of sand, while the quicklime is usually purchased from kilns situated some distance away. In some localities, limestone suitable for the manufacture of quicklime occurs in close proximity to sand which may be used in manufacturing sand-lime brick. In any case, the cost of the raw materials used in the manufacture of sand-lime brick will exceed the cost of the raw clay used in the manufacture of the same quality of clay brick. The difference in cost will vary with the locality and must be considered separately for each individual case.

If one includes the labor required in the manufacture of quicklime as a part of the labor required in the manufacture of sand-lime brick the cost ought not to be very different from that of the labor required in the manufacture of clay brick.

More fuel is required in the manufacture of clay brick than in the manufacture of sand-lime brick.

The minimum investment in a sand-lime brick plant far exceeds the ordinary investment in a clay brick plant of a corresponding capacity. It has been pointed out by S. V. Peppel that a well-equipped sand-lime brick plant having a capacity of from 16,000 to 20,000 brick in ten or twelve hours, will cost, independent of site, from $20,000 to $25,000. Mr. Peppel has again estimated that the cost of production of sand-lime brick in this country independent of depreciation and interest on investment, is from $2.50 to $4.00 per thousand.

On the other hand, a soft mud brick plant, including pallet sheds and having a capacity of 40,000 brick a day, can be installed for about $5,000. The cost of manufacturing the soft mud brick with such a plant ought not to exceed $3.50 per thousand. This will depend, however, upon the price of labor and fuel. I have known plants where the cost per thousand of manufacturing a first-class soft mud brick did not exceed $2.40.

There are many places where clay suitable for the manufacture of brick is not found. In these places one may find an abundance of limestone, suitable for the manufacture of quicklime and sand. In such localities, sand-lime brick can probably be manufactured in successful competition with brick shipped in from other places. Wherever there is an abundance of suitable clay and fuel, it is thought that the sand-lime brick products will never enter into serious competion with brick manufactured out of clay.

There is evidently greater liability of securing an inferior or irregular product from sand and lime than from clay. The manufacture of sand-lime brick introduces operations which are more delicate than those met with in the manufacture of clay brick. For this reason brick manufactured out of clay still occupies the leading place among the building materials of this country.

I am not yet convinced that it is possible to produce colors, in the sand-lime products, which are as permanent as those in the clay products. Sometimes this may be accomplished Any coloring matter which may be added to concrete or sand-lime brick mixtures must be in the shape of a mechanical mixture, and often it is simply washed over the surface. In the case of burned clay products the coloring matter, in all first-class materials, is chemically combined with the clay body. One of the great obstacles to the successful manufacture of concrete building blocks is the inability to obtain strong permanent colors.

In order to render concrete building blocks impervious to moisture it is necessary to give them a coating of neat cement. This is not always done, but it is nevertheless an important precaution against weathering. Although I am not acquainted with any process by which it could be accomplished, yet it may be possible to enamel or glaze concrete and sand-lime brick products. This is a field which is still open to investigation. It may be that, some time, the sand-lime products will be enameled and glazed with greater success than are the clay products at this time.

It has been argued by some that sand-lime brick are more refractory than clay brick. This, however, has not been demonstrated, and from a theoretical standpoint cannot be true. A product which consists chiefly of free silica and lime should be reduced to a slag at a much lower temperature than the fire clay products with which we are all familiar. With regard to the fire-resisting properties of sand-lime brick, Mr. Peppel says: "The application of great heat followed by sudden quenching with water destroys to some extent the bond on the surface and to a little depth beneath, but leaves the brick safe and intact. There is seldom any cracking or breaking of the brick and the softening did not seem to penetrate the brick to any great extent." In this discussion of the sand-lime brick industry, published in a report of the U. S. Geological Survey on the Mineral Resources of the United States for 1903, no figures are given to show the temperatures to which the brick were subjected. It must, however, have been under the point of fusion. In order to be classed as a refractory material this product should withstand a temperature of 2,500° F. without melting. Sand-lime brick may be less susceptible to sudden changes of temperature and even may show less injury when subjected to moderately high temperature than clay building brick, but this does not bring them within the class of refractory products. One may even question their less susceptibility to sudden changes of temperature when compared with clay building brick.

In regard to the use of concrete building blocks and reinforced concrete, although the laboratory tests have been eminently satisfactory, it may be said that these products have yet to demonstrate their strength and durability, and therefore their suitability for buildings and other constructions. The concrete building blocks which are being placed on the market, in competition with stone and terra cotta, are to all appearances sufficiently strong and durable for the purposes for which they are being used.

The best burned clay products exceed the sand-lime and cement products in strength and will resist better any abrasion to which they may be subjected.

The sand-lime and cement-concrete products will probably never supplant brick and terra cotta. They will, undoubtedly, supplement them, and in localities where the raw materials for the manufacture of brick are absent, these products may be used almost exclusively. In the business sections of the large cities, where color is not an important consideration, reinforced concrete, as well as sand-lime products, may come into use quite extensively, where to-day stone, terra cotta and brick are employed. We need not anticipate any diminution in the output of brick and terra cotta or any decrease in their price, on account of the introduction of sand-lime brick products and cement concrete.

The demand for permanent materials in the construction of buildings is increasing so rapidly that all of the old as well as the new products will find a market. Should time and experience ever demonstrate that the sand-lime and cement products are superior to burned clay, then we may hope that these will be given preference, and everywhere we shall hope to find the people using the most suitable building materials.

PRICES.*

BY D. W. STOOKEY, CEDAR RAPIDS, IA.

When I accepted a place on the program and chose the subject of prices, I did not know that there was to be another coming before me with practically the same subject. However, I am not too proud to "play second fiddle" at this time. My thought and desire is to hold prices up. I will echo a second to anything that may be said on that subject. Tile makers have worked long enough for the public good. They have earned, justly deserved, and should demand a fair share of the profits of tile making and tile drainage. If they will adopt the same methods that bring financial success in other lines, they will be rewarded. They manufacture an article that the people want, a necessity, and one that can be sold at a good profit.

Prices used to be much higher than they are now. In the early days of tile making and tile drainage in Illinois my father paid $75.00 per thousand for eight-sided five-inch tile that only measured about four and a half inches. Today many of our tender-hearted, weak-kneed, easy-mark brethren are selling nice round full measure five-inch tile for less than one-third that amount, and why? Simply because they cut the price to hold a customer who worked them, beat them down, and told their competitors what tile could be bought for at the other place. Then the other easy mark cut the price to meet the first, and finally they had cut off their profit. The idea of never allowing a competitor to undersell looks well, possibly, in a newspaper advertisement, but it is a falacy, a will-o'-the-wisp, that will rapidly lead any tile maker to destruction. The old hollow ring of "quick sales and small profits" has a cheering sound to the tenderfoot who has gone into some mercantile business with his father's or his wife's capital, but it is a false light that will surely lead any tile maker to ruin.

Quick, repeated, and continuous sales can only be made where the stock can be replenished as fast as sold. No tile maker can do that. Each factory can only make a certain limited amount each year. This amount is the measure of the maker's stock and sales. When these are sold his income stops. If he has sold them according to the plan of quick sales and small profits, he must accept the small profits for his year's net income.

Every tile maker can find among his customers many who will testify that they have raised crops on tiled land where they could raise nothing before, and that these crops, in from one to three years, would pay the whole expense of drainage. This means that they have made from 33 to 100 per cent on the money invested in tile drainage. They get their money all back in from one to three years and continue to get good returns each year thereafter without additional expense. They boast that they made a good deal when they bought tile and drained their wet land. The deal was so good that they could profitably have paid from 33 to 50 per cent more for their tile. The experience of some of us during the last three years has shown that farmers would pay much more for tile than they have been asked to pay. I am getting 33 per cent more than I did a few years ago. I get it easier, sell tile more readily, and sell more tile.

Tile making and tile drainage have passed the experimental stage. The charge that they have taken all the water out of the country and there will be no more wet seasons has been disproved. The good old promise that we shall have "rain in due season and land shall yield increase," may be depended upon yet, even after so much water has been carried away by tile drainage. The wet seasons of the last three years have proved that the seasons are uncertain. Wet seasons may come. Crops on low land are not safe, and profitable returns are only assured when such land is drained. Iowa lands are held at such high prices that they are only paying a fair interest on their valuation when they are made to give the best returns possible. In general Iowa farmers realize that these conditions exist and they know that profitable returns can only be obtained by a liberal use of drain tile.

To summarize, tile drainage is eminently profitable to the Iowa farmer, so remunerative that he could afford to pay much more for tile than he has been asked in the past. His lands are held at such a high valuation that he can only get fair returns for his investment by producing the best crops possible. Iowa seasons are so uncertain and Iowa soil so susceptible to changes in the amount of rainfall, that good crops can only be assured by the aid of tile drainage. The Iowa farmer must use tile. He can well afford to pay more than he has ever paid before and yet have left an unusually large per cent of profit on the investment. He should be asked to divide with the tile maker, who at the low prices received for tile in the past has not had a fair share of the benefits. Tile makers have done the state good service. They have put their capital, time, and many of them the best part of their lives into the work. They are entitled to a fair share of the profits, they have earned it, and in the future should claim it.

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*Read at the last meeting of the Iowa Brick and Tile Association.

$12.25 TO NIAGARA FALLS AND RETURN

Via Nickel Plate Road, June 18th, 19th and 20th, with return limit of June 24th, or by depositing ticket limit of July 14th may be obtained. Through vestibuled sleeping cars. Three through daily trains. No excess fare charged on any train on the Nickel Plate Road. Meals served in Nickel Plate dining-cars, on American Club Meal Plan, ranging in price from 35 cents to $1.00; also service a la carte. For further information, write John Y. Calahan, General Agent, 113 Adams St., Room 298, Chicago, Ill. Passenger Station at Chicago, corner Van Buren and La Salle Sts., on the Elevated Loop. Chicago City Ticket Offices, 111 Adams St., and Auditorium Annex.

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GLASS PAVING AND BUILDING BRICK.

GRENOBLE.

About a year ago paving brick of pure crystal glass, based on scientific principles for the diffusion of natural light by radiation, made their appearance on the markets of France, and repeated tests and trials having fully demonstrated their value, they began to find favor with the general public and are being employed in increasing proportions by builders and contractors.

In Grenoble several buildings have already been provided with them, and from personal observation they appear to answer admirably the purpose for which they are intended, namely, the better lighting of cellars, underground rooms, dark corners, etc., by the radiation of natural light.

The following firms are engaged in the manufacture of these bricks: The Luxfer Prism Co., 9 Cours de la Liberte, Lyon; The St. Gobain, Chauny & Cirey Co., 9 rue St. Cecile, Paris, and Messrs. Palon & Royer, 76 avenue de la Republique, Paris.

I inclose the prospectus of Messrs. Palon & Royer, who are the sole agents and concessionaires of the Mombel luminous brick, in which will be found ample details concerning the different varieties manufactured, their sizes and prices, and the application for which each kind is adapted.

T. W. Murton, *Vice and Deputy Consul.*

LYON.

Early in October, 1898, a paving company of this city began laying on the rue de la Republique a piece of pavement of ceramo-crystal, ceramic stone, or devitrified glass. During November and December, 1898, and thus far in January, 1899, this pavement has been driven over during all hours of the day and night. It has stood as hard usage as any pavement could be subjected to during that time, and is still in an admirable state of preservation. The glass, or ceramic stone, pavement is laid in the form of blocks 8 inches square, each block containing 16 parts in the form of checkers. These blocks are so closely fitted together that water can not pass between them, and the whole pavement looks like one large checkerboard. Like all thoroughfares in France, the roadbed slopes gently to the walk on each side. Some of the edges of the checkers have been broken off during their three months' service. I counted some twenty of them that have been slightly chipped on the edges. It is contended, and I think with justice, that this does not argue against the value of the material as a pavement, and that any kind of stone would have suffered just as much or more in the same time.

I visited the Ceramo-Crystal Manufacturing Company's works yesterday, at the suburban village of Demi-Lune, about 6 miles from Lyon. The factories cover nearly 8,000 square yards of ground. Work is now stopped in them while additions are being made to the buildings in the shape of second stories. In the yards are many tons of broken bottles, which the superintendent told me was their "raw material." On the four sides of a large brick smoke-stack are specimens of ceramo-crystal for buildings and interior decoration, some of the pieces as smooth as highly polished marble, others rough like cut stone, and still others having a surface like common brick.

The advantages attributed to this ceramo-crystal by the manufacturers are: As a pavement, it has greater resistance than stone; it is a poor conductor of cold, and ice will not form upon it readily; dirt will not accumulate upon it as easily as upon stone, and it will not retain microbes; it is more durable than stone and just as cheap.

The Central Architectural Society of France made a report recently on this ceramic stone, of which I give a brief synopsis. An officer of the society reported that he had examined a square, suitable as a pavement or floor for a stable, courtyard, or factory; a block imitating polished marble, a block imitating mosaic, and a panel with molding and ornamentation. He said:

"From the various forms in which this material is presented its use can be readily determined for both practical and decorative purposes. On careful examination it is found that the Garchey ceramic stone is nothing but glass brought to a special molecular condition. In a certain sense it constitutes a new substance which resembles flagstone, granite or marble. The manufacturer assures us that with this material he can copy any model that is presented. The product is obtained from broken glass heated to a temperature of 1,250 degrees and compressed in matrices by hydraulic force. The physical transformation ot glass is due to devitrification under the Garchey process. The phenomenon of devitrification produces a sort of dissolution more apparent than real; for, upon chemical analysis, the devitrified glass preserves the identical composition of natural glass. It may be said, then, that devitrified glass possesses all the intrinsic qualities (physical and chemical) of glass except the transparency, while taking on an entirely different aspect. Furthermore, glass treated under this new method is made to resist crushing, frost, and heavy shocks, and to stand usage."

The subject is being discussed in the press and is receiving general consideration. An elaborate and exhaustive article in the Revue des Deux Mondes for November treated it under the heading of "A glass house," the writer asserting that a large house constructed entirely of glass would be an attractive feature of the coming world's exposition in 1900. He said that glass could be used for tubes, pipes, vats, tiles, smokestacks for factories, and for buildings. Double glass walls in a house would admit of the circulation between them of cold or warm air, thus regulating the temperature. "As to the resistance of such a structure, it would certainly be equal to that of the most solid houses of the day, * * * and it is lighter and less expensive than brick." "The Garchey glass stone had hardly come into existence before a method of using it, both simple and inexpensive, was revealed by the device of the American inventor Golding."

The glass house, or the luminous palace, which it has been decided to build on the grounds of the 1900 exposition, parts of which are now being constructed, is thus described by the writer last quoted:

"The principal facade, in the form of an immense portico, its roof surmounted with spires and with a winged statue representing light, will be supported by heavy columns. The ground floor, reached by a double flight of stairs, will be used as a great exposition room. To the right and left will be large glass basins, overhung by grottoes of glass. In the interior of the hall will be five large openings, in which will be represented the five divisions of the globe."

John C. Covert, *Consul.*

NICE.

The manufacture of glass paving bricks is not carried on in this district, and no bricks of this character are utilized for building purposes. Some years ago the municipality authorized an individual representing a manufacturer to pave with glass bricks a piece of the principal business thoroughfare, having a surface of about 1,000 square feet. It would appear that the experiment did not satisfy the authorities, for the piece of pavement was removed some months afterwards. I remember seeing the bricks laid, and it struck me that the work was being very hastily and superficially done, and I noticed shortly afterwards that the bricks had moved.

Harold S. Van Buren, *Consul.*

PARIS.

The use of glass in the manufacture of blocks has been discussed for some years, and the new glass stone made by the Garchey Company seems to be the most improved kind yet patented or invented. It is glass devitrified by a special process, and offers a resistance of about three times that of granite. The atmosphere seems to have no effect upon it. It is claimed by the makers, the Compagnie de la Pierre de Verre Garchey, 4 Rue Charras, Paris (with branch factories in England, Belgium, Germany, and Russia), that it is harder than St. Raphael porphyry, and twice as hard as Comblanchien stone. It is also said to be capable of resisting an electric current of 60,000 volts, thus making it an excellent insulator by reason of its great resistance to high electrical tensions, to crushing, and to impact.

The process is patented, but appears to be simple, viz: The glass is devitrified, put into molds, which are placed under hydraulic pressure and the block allowed to become hard. I enclose a copy of the company's catalogue, showing sizes of blocks, shapes, combinations, etc. Mr. Cheswright, of 29 Rue Mogador, Paris, who is interested in the patent, states that he will be pleased to give information as to rights of manufacture, etc., to any American firms writing to him direct.

There is also a hollow brick made of glass by the Société des Verreries de Dorignies, Nord, France, of which I send two or three samples; also a certain catalogue marked Exhibit 2. Mr. L. Viennot, 9 Boulevard de Denain, is the agent in Paris, but it is preferable to communicate direct with the company at Dorignies, Nord, France. Their bricks are hollow, but in different shapes and combination, and are suited for the construction of party walls, conservatories, etc.

I also enclose price list of perforated glass blocks made by Appert Frères, 34 Rue des Chasses, Clichy, Seine. These are suited for tops of windows, roofs, etc., for hospitals, barracks, factories, and kitchens.

JOHN K. GOWDY, *Consul-General.*

ST. ETIENNE.

Some years ago a plant was put up in this city for making bricks with glass as a base, but was closed in a very short time, the product finding no market. No other attempts in this department or in the others comprising this district have been undertaken. Bricks made from pure glass are almost unknown here. Some shops and hotels are furnished with floors or patches of floor made of glass, but no glass bricks are used in the streets in lieu of the ordinary stone. For building purposes no experiments have been made with such material. Glass tiles for sky and floor lights are coming into favor with architects. They are made of very transparent glass and cost 77 cents each, their usual dimensions being 16 by 10 inches. These tiles are chiefly manufactured at Passavant (Häute Saone) and at Ecuisses (Saone et Loire), while the glass flooring comes from St. Gobin, near Paris. The use of bricks or tiles is very limited in the district, although on the increase as compared with former years.

SUCCEEDS CLAYTON H. THORNDYKE AT HYDRAULIC PRESSED BRICK WORKS.

R. E. Kelley succeeds the late Clayton H. Thorndyke as general manager of the Findlay (O.) Hydraulic Pressed Brick Co. works. He will have charge of the company's plants at Toledo as well as the one in Findlay. Mr. Kelley has served with the company the last two years as a traveling salesman and has risen through merit to his present position.

DISTRICT ATTORNEY SEEGER SCATTERS A MOB WITH A GUN AND A LOT OF NERVE.

District Attorney A. H. F. Seeger of Orange County, N. H., almost alone, and with a lot of nerve, cowed and subdued several hundred Italian and negro brickyard strikers at New Windsor. Emboldened by the success last week of hundreds of Italian, Hungarian and negro brickyard strikers over the river in Dutchess county, the laborers in Walsh's New Windsor yard started out at 4 o'clock, with a red flag at the head of their column, to force the men away from the yards of the Davidsons, William Lahey, Hedges and others. At some of the yards the men were satisfied and refused to leave.

The strikers not only wanted more wages, but they insisted on a reduction to 22,500 brick a day, whether the output capacity of a yard was double that or not. At the Davidson yard they visited the engine house and ordered the engineer to shut down the engine. Hugh Davidson was there and he sent for his gun. When it came he told the strikers he would blow the head off the first man who attempted to touch the machine.

Then the strikers visited the Lahey yard, where they drove off the men. James S. Jones, the negro foreman, refused to leave until a big Italian stuck a revolver in his face and he was then compelled to quit. Other similar things happened, but in the meantime word was telephoned to the sheriff, telling him of the trouble, and District Attorney Seeger was also notified.

Mr. Seeger left his breakfast table immediately and was first at the brickyards, two or three miles away. He took hold at once in the most vigorous fashion. He asked for a gun and got a double-barreled shotgun. He lost no time in getting in the very midst of the strikers, who numbered about 300.

"I want to say right here," said he, "that any one who is dissatisfied has a perfect right to strike. No one who does not want to work is forced to, but those who do want to work can do so, and any one who attempts to do any violence is going to get hurt."

Mr. Seeger's words and his determined stand with the shotgun in hand had an amazing effect. In a short time the red flag was out of sight and the clubs, sticks and shooters of the strikers as quickly vanished.

The strikers then scattered and, re-enforced by officers from Newburgh, the District Attorney set out to capture and jail the ringleaders. Justice Flynn of New Windsor had arrived on the ground and John Doe warrants were speedily filled out. When this was done Mr. Seeger, with some of the officers, started in pursuit of the men wanted. The District Attorney, with gun on his shoulders, chased one of the leaders up a big hill, but the fellow had too much start of him. Two or three other ringleaders were caught, however, and taken before Justice Flynn and then to jail. They will have a hearing and will most likely be held for the Grand Jury.

The C. W. Raymond Co., Dayton, Ohio, is installing a complete line of Raymond machinery for the Albert Lea (Minn.) Brick & Tile Co.

ABOUT HOLLOW CONCRETE BUILDING BLOCKS.

By H. S. Palmer.

In the May number of the "Municipal Engineering," published at Indianapolis, Ind., is an inquiry from Sparta, Ont., in regard to patents on hollow concrete building blocks and machines, and believing that many others are also interested in the same thing, I desire the privilege of giving some information on this important subject in answer to "L. M.," having had some considerable experience in patent law, besides it is well understood that any reference to patents on hollow blocks or machines bears directly on the company of which I am president.

It is well known that we were in the business ten or twelve years before any other machine or device of any kind made its appearance for producing hollow blocks and up to the present time nothing has appeared with any advancement of merit whatever over our 1899 patents.

As stated above, twelve years were consumed by us in bringing the art to that state where it would even be noticed by architects and others and the expense and trouble was all borne by us, believing it would win out to the betterment of the building industry, in which case we would be rewarded. It proved as we predicted, but in the meantime we had secured patents, injuring or defrauding no one, nor infringing any other patents whatsoever and the benefits rightly belong to us; every honest man will agree. The patent laws were made to protect the one who by his skill and industry produces something which benefits the people. This protection is not to be set aside by incomplete experiments which may be shown by would-be infringers. The proof of invention in most cases is *do the public acknowledge* novelty and usefulness by grasping the products? Could anything be more fair than this simple vote? It is recognized more than any other by the United States courts. Every fair-minded man concedes this to be just and it is law.

Accordingly we sold to others the rights which the Patent Office gave us and there was no way for us to even suspect the wholesale onslaught which was to be made upon us and our customers by infringers, which by their numbers, proves the novelty and value of our patents. An official of the Patent Office made the remark in my hearing: "If the old way was just as good why don't they use it?" The fact that they do not proves the novelty and usefulness. People came to us and bought by the score of their own accord and hundreds of testimonials state that they would be perfectly satisfied if it were not for persistent infringers.

If there was any improvement in machines or the industry it might be different, but there has been no advancement of merit whatever in either since our 1899 patents. All others have been simply clogs to the industry by confounding and mystifying the public by false statements and literature disseminating theories without experience until people know not what to think or what to do. The practical block maker, however, is not at all disturbed by this state of affairs, and to the practical machine maker it is a source of amusement, although annoying from the fact that it takes so much longer to educate the people and eradicate the trouble, but time will do it.

Honest men will not appropriate the property of others whether it be lands granted by the United States or patents granted by the United States. This is a quotation from a prominent official, and is forcibly brought to our notice through numerous letters which we receive on this subject and in some cases people have openly discarded infringing machines after buying them, and taking ours, not only because they are the best, but to keep within the law.

The delays in the numerous suits which we have against infringers has been caused in every case by the defendants asking for more time. In one case in Illinois, our prima facie proofs have been completed more than three months, and we are and always have been anxious to get to a point where our patents would be adjudicated, after which case we can get injunctions immediately, and plenty of them.

In view of the question from "L. M.," we wish to state our position so that not only he but others like him will understand the position we are in. We were the first to start the hollow block industry and were given patents. Everybody realized they were valuable, and like everything else which is good, imitators sprung up all over the country so thick and fast that it was impossible to attend to them all at once and we are getting all information possible for future use, which explains the "Special Notice" of which he speaks. A registered letter is notice in law from which we can claim damages, and it also gives us six years in which to bring suit and the judge can assess the damages to three times the actual amount as punishment. Buying a machine before suits are decided does not exempt the innocent purchaser from damages if it proves to be an infringement.

Owners and users of infringing machines are equally guilty before the law, and the owner of any building containing patented blocks would be liable should the patents finally be sustained. Ignorance of the patent laws excuses no one and personal or other bonds will not release the guilty party. These points and many others will be sent to all those who ask for a little book containing many patent decisions, which will be sent from the office of H. S. Palmer Co.

TO BE WORLD'S BIGGEST BRICK PLANT.

A. A. Gerry of Reading, Pa., president of the United States Brick Company, owning the brick yards at Reading, Pa., and other places, who purchased the Catskill Paving Brick Company plant (New York), purchased 558 acres of land of Sheriff Post, about two miles south of Catskill. The company will commence work at once to erect the largest brick plant in the world with an output of one million brick daily. It will employ 1,000 men. This property has an unexhaustible supply of cement rock and will turn out the best quality brick known. Options have been taken on other farms on the line and in a few years there will be a continuous line of cement and brick works from here to Saugerties.

OAKLAND BUILDS FIREBRICK PLANT.

The development of what for years has been known as the marsh land south of the Southern Pacific track is exceeding all expectation of people who have long looked upon that section as the home of manufacturers, which would greatly add to the industrial importance of Oakland, Cal.

The development is due to the enterprise of what is known as the American Magnesite Company, at whose instance the Supervisors of Alameda county are building a road from Livermore to connect with the mines of that company and bring the product of these mines from across the Santa Clara county line into this city. Here that product will be manufactured into a number of articles, among them fire-brick, which, it is said, will be the finest in the world.

The work of construction, which is in progress, is under the direction of H. W. Grant, a young man who has recently been brought here for that purpose, and who comes after some years of service in the same work in Chester, Pa.

On the place in question there are in course of erection under the auspices of the Rose Fire Brick Company, which is one of the proteges of the Magnesite Company, a number of brick and cement buildings which will be excelled in no other part of the country.

Work on the fire-brick plant is being pushed ahead as rapidly as possible. A gang of about seventy men is now busily engaged upon the scene. These are driving piles, puddling and building walls of most solid construction.

These walls are of concrete, nearly six feet in height and will act as a foundation for a superstructure of brick which will be practical in construction and ornate in appearance.

One of these will be known as the "panroom," in which the brick will be molded. This will be 70 by 180 feet. The other will be the drier, which will be 150 by 120 feet.

There will also be two warehouses 150 by 75 feet and eight kilns, each about 50 by 30 feet.

The material for working in the structure will be brought here in cars from the magnesite mines near Livermore. These cars will be run up an inclined plane and the material will be dumped into bins beneath. From these bins the material will fall into crushers, and after having been reduced to a certain consistency, the material will be raised in automatic elevators to the higher end of a rotary screw, sixty-four feet in length, the shell of which will be acted upon with great heat and thus in passing through the tube the clay will be calcined.

After calcination, the clay will be reduced to a fine powder and sold for various purposes. Such of it as will be required for fire-brick will be puddled, afterwards placed in molds and then submitted to heat of the greatest intensity and thus made impervious to flame. It will then be ready for use wherever such material is required, and for it there is a demand all over the country.

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The Bach Brick Co., Chicago, has been incorporated, with $35,000 capital stock, by Frederick Bach, Major McGregor and Charles C. Johnson.

BRICK PLANT WRECKED BY A BOILER EXPLOSION.

By an explosion of the boiler of an 80-horsepower stationary engine at the brick plant of McIntyre Bros., on the old Shell Road, nearly two miles from the heart of Montgomery, Ala., was wrecked and Tom King, a negro fireman, was killed instantly.

The loss to the brick plant is approximated at $7,000, and the firm carried $5,000 casualty insurance. The wrecked portion of the plant will be rebuilt as soon as the insurance is adjusted.

The shock of the explosion was distinctly felt throughout the city, persons residing at least three miles from the scene having said that they heard the report and felt the concussion.

The body of King, the negro fireman, was literally torn to pieces. Remnants of the negro's body were scattered over an area of forty square feet and bits of his flesh in the wreckage afforded a grewsome spectacle to those who visited the brick plant.

If the terrible accident had not occurred early in the morning a great loss of life might have resulted. About forty men are employed at the plant, but they had not begun their day's labor. Only King, the negro fireman, and Edgar Knowlton, the white foreman, who had a marvelous escape from death, were at the plant when preparations for the day's work were commenced and when the explosion occurred.

King's body was severed near the trunk. The trunk was found lying on the engine bed, only a few feet from the side of the exploded boiler, and was mangled terribly.

Mr. Knowlton, the foreman, had just gone from the boiler room to a well some yards from the brick engine house, when the explosion occurred, and he had a narrow escape from being killed by the flying debris. King had fired up the boiler and had gotten up steam. It is said that Mr. Knowlton spoke to him about getting up so much steam half an hour before the plant began operation.

Lying next to the boiler that exploded, in the mass of masonry, was a 110-horsepower engine and boiler, and this was blown by the force of the explosion through a brick wall that formed one side of the engine room. The tremendous mass of steel was lifted out of its socket and thrown fifteen feet out of the room, as if a mighty derrick had picked it up and swung it out to its present position on the ground. Everything within a radius of forty feet of the explosion was demolished, which included the entire boiler house, with all of its valuable machinery for making brick. One brick cutter, valued at $600, was about the only machine that was not reduced to scrap iron by the impact of the flying mass of steel and masonry.

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GOOD SHOWING FOR THE ILLINOIS BRICK CO.

The Illinois Brick Company is said to be earning 20 per cent on the new capital of $4,000,000. Thus far there has been very little trading in the new shares. Occasional sales have been made at 66 and the stock seems to be very closely held. The dividends at the rate of 8 per cent show an interest return to the investors of about 12.20 per cent.

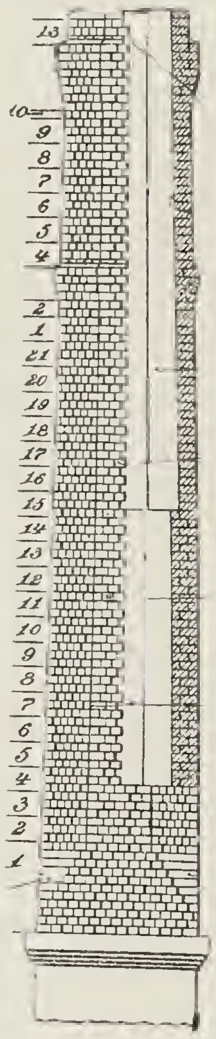
NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

These new inventions are those that are especially of interest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

787,770. Process of Manufacturing Fire-Bricks, Crucibles, Retorts, or Other Refractory Articles. Paul Klein, Riga, Russia. Filed Oct. 2, 1903. Serial No. 175,518.

Claim.—A process for manufacturing refractory articles, consisting in pulverizing chrome ore, separating the easily-fusible admixtures therefrom, mixing the chrome ore thus obtained with pulverized fire-clay and with pure hydrate of alumina, molding and pressing and then burning such mixture, substantially as herein described.

785,779. Art of Constructing Chimneys or Stacks. George H. Thirsk, Philadelphia, Pa. Filed Dec. 5, 1904. Serial No. 235,530.

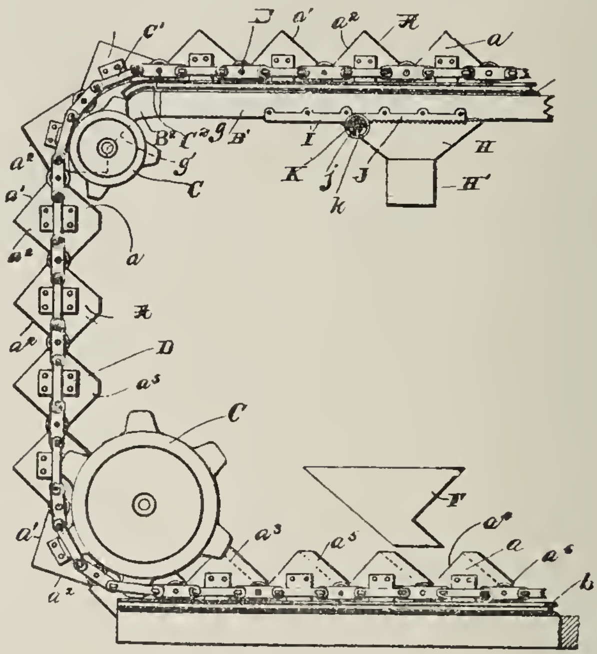


Claim.—A chimney or stack composed of angular brick, each brick slightly less in size than the preceding one to form the corners of the chimney or stack and taper therein, rectangular brick to form the sides of the chimney or stack, and said angular brick and rectangular brick arranged in courses adapted to provide a true bond throughout of the structure.

A chimney or stack, composed of two types of brick, one type consisting of rectangular brick and the other consisting of angular brick, the angular brick adapted to form the inner and outer corners and the rectangular brick in conjunction with the angular brick adapted to form the sides of the chimney and by the courses of brick formed to provide a true plumb bond throughout of the structure.

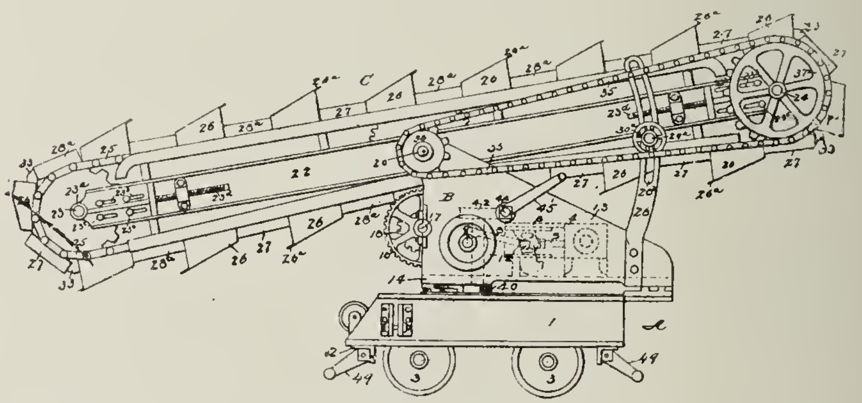
787,598. Conveyor. Alfred J. Webster, Columbus, Ohio, assignor to Joseph A. Jeffrey, Columbus, Ohio. Filed Nov. 30, 1897. Serial No. 660,277.

Claim.—In a conveyor, the combination of a chain at each side of the conveyer, a substantially endless series of buckets, each closely adjacent to those next to it, each rigidly connected to the chains, and each having a closed side a^3 which projects upward at a forward inclination relative to the loading "run" of the chain, and an open receiving side projecting upward and backward and extending substantially entirely to the upper edge of said side, a^3, whereby the material begins to escape from the bucket immediately upon its passing the upward wheel of the conveyer, as at C, and whereby the said side a^3 can serve as a flight or scraper upon the emptied material, substantially as set forth.

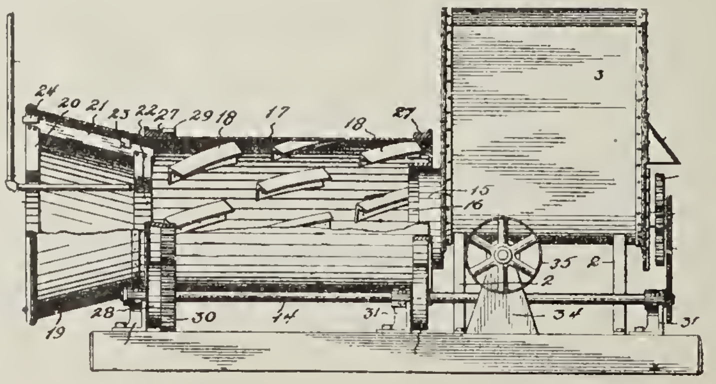


787,601. Portable Conveyer. Freeman R. Willson, Jr., Columbus, Ohio, assignor to Joseph A. Jeffrey, Columbus, Ohio. Filed Apr. 24, 1900. Serial No. 14,113.

Claim.—In a portable conveyer for loading ore, and other purposes, the combination of a car, a carriage supported thereon, and formed with upward-extending frame-pieces, a vertical pivot uniting the carriage and the car, about which the former is arranged to turn, means for adjusting the carriage about the said pivot, a conveyer-frame comprising side bars, and laterally-extending trunnions connected with the side bars of the conveyer-frame near its middle portion, longitudinally, the said trunnions being fitted in bearings in the said upward-extending frame-pieces of the carriage, a shaft 20 passing through the said trunnions and free to rotate therein, an endless conveyer mounted in the conveyer-frame, and having digging and conveying buckets and ore-containing chutes between said buckets, a motor on the carriage and driving-gearing between the motor and the said shaft 20 and between the shaft 20 and the conveyer, substantially as set forth.

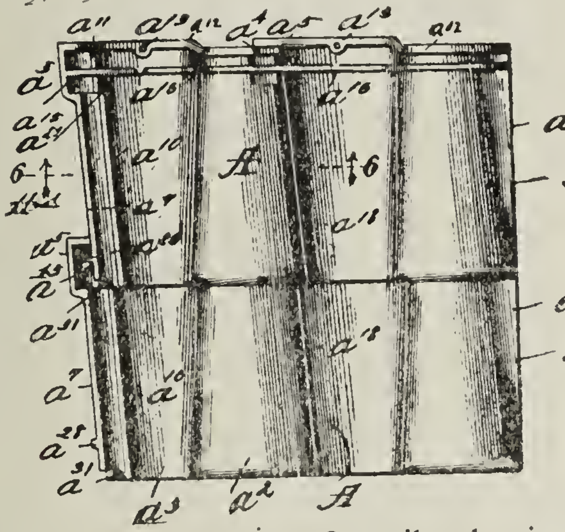


787,441. Mixing-Machine. James Embleton, Columbus, Ohio, assignor to J. F. Angell, Columbus, Ohio. Filed Nov. 7. 1904. Serial No. 231,710.



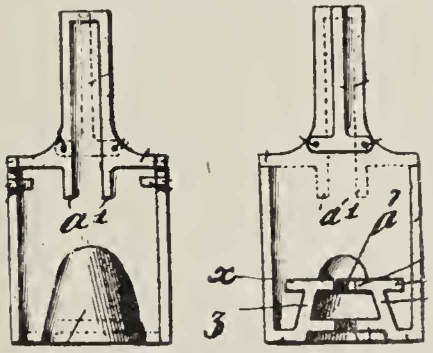
Claim.—In a mixing-machine, the combination with feeding means, of a revolving mixing-drum having forwardly-, inclined mixing devices arranged upon its inner periphery, a flaring delivery-spout carried upon the drum and movable therewith, a mixing-wheel fitting loosely in the spout, means projecting from the spout and engaging the mixing-wheel to cause the same to turn with the spout, means for introducing water into the spout, and means for imparting motion to the drum.

787,474. Roofing-Tile. Leslie G. Sharp, Chicago, Ill. Filed June 9, 1904. Serial No. 211,764.



Claim.—An improved roofing-tile, having a body part made with the greater portion of its two sides parallel to each other, an inward jog made in one of said sides in an upper corner of said body part, an outwardly-projecting part made on the other of said sides in the opposite upper corner of said body part, said outwardly-projecting part adapted to receive the inwardly-jogged overlapping part of a similar tile when such tile are laid together in forming a roof, a downwardly-projecting marginal part or flange made on said body part and extended along the same side thereof that has the said inward jog and following the contour of said inward jog to the upper end of the body part, an upwardly-projecting marginal part or flange made on said body part and extended along the same side thereof that has said outwardly-projecting part and jogged around the lower end and corner of said outwardly-projecting part to the upper end of said body part, and suitable means for securing said tile to a roof foundation, all when made substantially as described and for the purposes set forth.

787,475. Roofing-Shingle. Leslie G. Sharp, Chicago, Ill. Filed June 18, 1904. Serial No. 213,060.

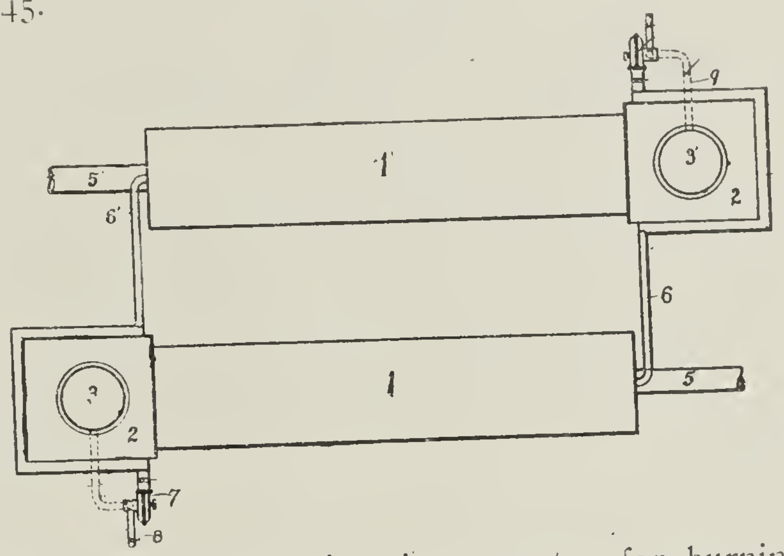


Claim.—An improved shingle-tile, having a body part made of an oblong outline, a central raised part made on the lower portion of the face of said body part, said central raised part hollowed out from the under side of said body part, a downwardly-projecting flange *z* made on the under side of said body part on the margin of the hollowed-out or cavity portion of said central raised part, and suitable means for securing said shingle-tile to a roof foundation, all when made substantially as and for the purposes set forth.

787,942. Compound for Paving-Bricks. Theodore S. Pierce, Walla Walla, Wash. Filed Aug. 26, 1903. Serial No. 170,815.

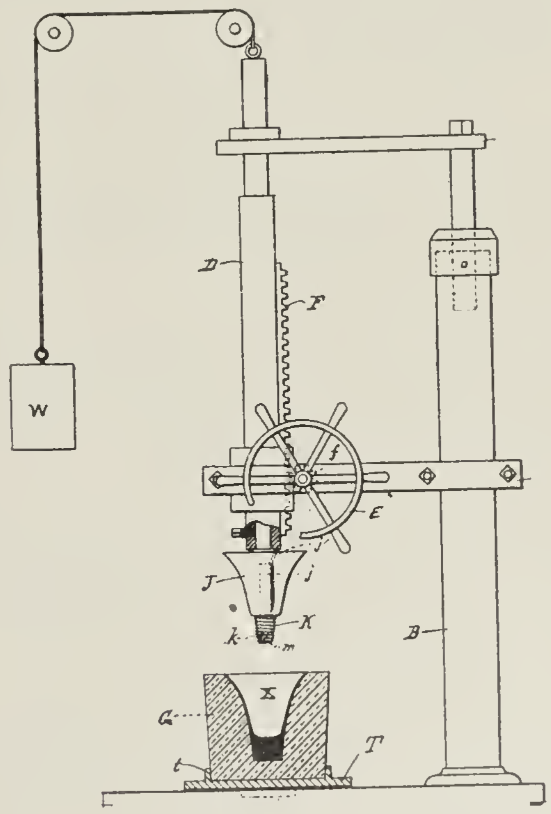
Claim.—The herein-described composition of matter, consisting of four parts of slag, one part of cement, mixed together, and then reduced to a plastic mass by the addition of a solution consisting of fifteen pounds of silicate of soda, two and one-half pounds litharge, one pound of sulfuric acid and forty gallons water in about the proportions specified.

788,503. Cement-Kiln. Carleton Ellis, New York, N. Y., assignor to Eldred Process Company, New York, N. Y., a Corporation of New York. Filed Feb. 17, 1905. Serial No. 246,045.



Claim.—The combination, in apparatus for burning cement, of a pair of long, rotary kilns so inclined that the material passing through one of said kilns travels in a direction approximately opposite to that of the flow of material in the other kiln, at the stack end of each kiln a continuous heat recuperator, means for passing air through said recuperator, and means for conveying the air, preheated by its passage through the recuperator of one kiln, into the juxtaposited fuel-feeding end of the other kiln.

788,120. Press for Plastic Material. George W. Thomas, East Liverpool, Ohio, assignor to The R. Thomas and Sons Company, East Liverpool, Ohio, a Corporation of Ohio. Filed July 21, 1904. Serial No. 217,556.



Claim.—A press for plastic material, comprising a mold and a mandrel having a fabric jacket whose upper margin is open to the mouth of the mold when the mandrel has been pressed into the mold, whereby the withdrawal of the mandrel from the mold is facilitated.

* * *

The American Brick Co., Los Angeles, Cal., has been chartered, with $20,000 capital stock. Directors are Horace M. Dobbins, Wm. M. Eason, Thaddeus Lowe and Robert Eason of Pasadena, G. A. Puntenney of Los Angeles.

CLAY RECORD.
PUBLISHED SEMI-MONTHLY BY THE
CLAY RECORD PUBLISHING COMPANY,
Ninth Floor, Plymouth Building,
303 Dearborn Street,
CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.
Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVI. MAY 31, 1905. No. 10

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

Be good, but not easy.

Some men never make a mistake because they never make a move.

'Tis a smart man who makes stepping-stones of his stumbling-blocks.

Opportunity never waits. If you are not on hand, someone else gets the chance.

A rooster crows the loudest in his own barnyard; likewise, a dog's tail curls proudest in the neighborhood where he lives.

Clay Record is the only semi-monthly clay paper published in America. It costs only one dollar for twenty-four numbers, or one year.

The United States, after a halt of nearly a year in its trade activity, has again started forward, with evidence on all sides of healthy industrial expansion. Two tests habitually applied by experts as a measure of trade conditions in this country are the exchange of bank checks at its clearing houses, showing the volume of business actually done, and the consumption of manufactured iron, showing the plans of general industry. If merchants, bankers, and manufacaurers make fewer payments through their banks, it means that the sales and purchases in their industry are reduced. If orders for iron and steel diminish, it is a sign that manufacturers, builders, and transportation companies foresee small business and are curtailing orders for new machinery, new structural material, and new rails or cars. Each of these signs of the times foretold with unpleasant clearness the reaction of 1903. The shrinkage in clearing-house exchanges, and the cutting in two of the country's iron production, pointed unmistakably to the coming storm. But the storm passed over rapidly. This season, bank checks put through the country clearing houses have surpassed all records in our history, rising in value 50 per cent over 1904. Iron production has reached a magnitude twice that of December, 1903, and never approached in the history of the trade. Consumption at the rate of nearly two million tons a month, where a million tons was the highest monthly average of any year up to 1900, is witness to the state of our industries.

It is not due to prejudice or because we were interested in the manufacturers of brick that we have always favored the use of brick in street paving, urging our friends, the brickmakers, to give more attention than they had been giving to this use of brick.

We have a new suggestion to make at this time in this connection: That the manufacturers of paving brick in this country get together and by some combination between them combine in employing methods that will result in rapidly expanding the use of brick in paving streets in towns and cities, and, as one of the means to that end, to establish a Board of Demonstration, whose duties shall be to demonstrate practically the value of brick for such purposes, this being done by going to communities and interesting them, obtaining permission to make a practical demonstration, say, paving a block or two at the Board's expense, but to be purchased by the town after a thorough test has been made, and the guarantees of the Board have been made good. This is not a new idea, for the asphalt companies have adopted it and are practicing it right along. Of course, this means the combination of the paving brick manufacturers throughout the country, just as the asphalt people have done, but to this there can be no objection. And it remains to say if it be done, the business will receive an impetus and will expand to an extent not dreamed of at this time, and will result in brick becoming the standard material for street paving, as it already is the standard material used in house building.

OBITUARY.

C. H. Thorndike, general manager and secretary-treasurer of the Findlay (Ohio) Hydraulic Press Brick Company, is dead.

Henry F. W. Grothe, a well-known brickmaker of York, Pa., died at his home, 348 Prospect St. Death was due to a cancer of the stomach. He was 77 years of age, and is survived by seven children.

Ellis P. Raymond, son of C. W. Raymond, of Dayton, Ohio, died at Mt. Clemens, Mich., where he had gone for relief from rheumatism. He was the vice-president of the C. W. Raymond Co. and was the manager of the New York office of the company.

Geo. J. M. Ashby died at his home in St. Louis, Mo., the 19th inst., after an illness of five weeks, of pneumonia. He was cremated the following day. Mr. Ashby was well and favorably known to many clayworkers, he at one time being the editor of *Brick*. Later he was secretary of the World's Fair Committee in charge of the clayworking exhibit.

CEMENT BLOCK MACHINE MANUFACTURERS TO FORM AN ASSOCIATION.

There has been a meeting called to be held at the Great Northern Hotel, Chicago, June 27 and 28, for the purpose of forming a National Association of Cement Block Machinery Manufacturers.

From the information received by the temporary chairman, he has been assured of the earnest co-operation of all the manufacturers, as an association is a necessity. The business has grown to such an extent that the time has come when the machine men must get together and talk over matters, the same as many other associations.

If you are a machine manufacturer, you are invited to come and become a charter member.

WILL BUILD $1,000,000 POTTERY AT NEWELL.

At a meeting of the stockholders of the North American Manufacturing Company it was decided to construct at Newell, W. Va., opposite to and connected with East Liverpool, O., by street railway, a $1,000,000 pottery of 30 ware kilns, with the largest warehouse and shop capacity of any pottery in the United States.

The men interested are among the most successful manufacturing potters in the United States: Joseph G. Lee, secretary of the Knowles, Taylor and Knowles Company; Edwin M. Knowles, president of the Edwin M. Knowles China Company; W. W. and H. N. Harker, owners of the Harker Pottery Company; W. E. Wells, secretary and treasurer of the Homer Laughlin China Company, and others. The move clinches the center of the potting industry in East Liverpool and means the concentration of the big pottery interests.

The men back of the project appreciate that future potting success lies in big plants, where the profits depend upon the large volume of output.

FIRES, DAMAGES AND LOSSES.

The Langenberg Brick Mfg. Co., Stevens Point, Wis., suffered a loss by fire at one of its plants. No insurance was carried.

The Baltimore (Md.) Brick Co. suffered a small loss in its plant at the foot of Jackson street by the shed over the kilns being burned.

James C. Drake has been appointed receiver of the Overton Pressed Brick Co., Tacoma, Wash. The company's liabilities are over $3,000.

One hundred molders and pressmen employed by the Crown Fire Clay Co., Canal Dover, Ohio, struck upon being notified to do slower work.

A small cyclone struck the Northern Pressed Brick Co.'s buildings at Crookston, Minn., and blew them down. The plant was in course of construction.

John H. Mossman has asked for a receiver for the Shinnick-Mossman Construction Co., 5th and Lydia Sts., Kansas City, Mo. They operate a brick plant and do general contract work.

The Barberton (O.) Pottery Co. has been made a defendant in bankruptcy proceedings. The petitioners are the East Liverpool Sagger Co. and the Ohio Silica Company. Geo. C. Murphy is the receiver.

The McDowell Brick Works, 17th and the Pennsylvania Railway, Columbus, Ohio, suffered quite a loss by fire. Had it not been for the good work of the fire department the plant would have burned to the ground.

The plant of the Coffeyville (Kan.) Pottery & Clay Co. was destroyed by fire. The loss is $30,000; insurance, $10,000. The fire is supposed to have been of incendiary origin. It will be rebuilt. J. S. Brown is the manager.

BRICK AND SUPPLY COMPANY GIVES BACK ITS CHARTER.

The Union Brick and Supply Company, a "close" corporation, formed to control the brick and builders' supplies of Columbus, Ohio, surrendered its charter, having found a row that was too difficult to hoe. It was incorporated under Ohio laws in 1902, and had the support of nearly every brickyard owner doing business in Columbus.

Twelve plants were taken into the company, which handled their combined outputs.

It was a stupendous task to complete the organization, but this was finally accomplished, notwithstanding the many difficulties. For about a year harmony prevailed, and all the companies seemed satisfied. Then the troubles began. The dissatisfaction on the part of one of the largest companies was sufficient to cause it to suddenly withdraw. This was soon followed by a second taking a like course. One after another decided to revert to their original organizations, and recently the company found it unprofitable to continue in business, with the result that the charter was surrendered.

The organization, at its inception, frightened a great many people, especially builders and architects, and their complaints were frequent and loud.

The business was managed by Anthony Berndroth.

GEORGE HINCHLIFF GETS REDRESS FOR THE RUIN OF HIS BUSINESS.

Chicago's "brick trust" was denounced in the branch Appellate Court by Judges Baker, Freeman and Smith as "a monopoly for monopoly," in its relations with the Bricklayers' Union and the Chicago Masons and Builders' Association. The declaration against the brick combine was made in a decision ordering payment of $15,000 to George Hinchliff, whose business as a brick manufacturer at Hobart, Ind., was ruined by the Chicago combine.

Hinchliff was making 15,000,000 brick a year at a profit of $10,000 annually prior to the formation of the combination of the brick manufacturers, builders and union laborers in 1898. Since then he has lost his $50,000 plant by foreclosure proceedings and has been fighting the "trust" in the courts for damages.

Hinchliff's loss was brought about by an agreement between manufacturers of brick on one hand and the Masons' and Builders' Association acting with the union on the other. The brickmakers gave the builders a rate of $1 a thousand less for brick than was given to outsiders. If the builders bought brick outside the combination they paid $1 a thousand more for them. The unions of hodcarriers and bricklayers refused to handle "independent" brick, and Hinchliff's product could find no market in Chicago.

At the time the agreement was made Hinchliff was the principal competitor of the "trust" in Cook county. One day the secretary of the Builders' Association called on Hinchliff and said the committee of the builders and manufacturers had held a meeting and decided to "request" him to sell no more brick in Chicago.

"Go right back and tell the committee they are a bigger lot of fools than I thought they were," said Hinchliff to the secretary. "Tell them I make a similar request of them. They are asking me to quit business."

Hinchliff testified: "My brick became absolutely worthless. Hardly a man in Chicago would touch them. Over 98 per cent of the workmen belonged to the union, and hod-carriers would not handle my product, nor bricklayers lay the brick."

To Hinchliff's suit for loss of his plant and the ruin of his business the brickmakers answered they had entered into no unlawful combination and had made no agreements that were not perfectly lawful. The Appellate Court's reply to the argument has been: "A single act or agreement may be lawful and even unobjectionable in itself and yet form a part of a series of acts and agreements which are unlawful, designed and made with an intention to interfere with public, personal and property rights in unlawful ways."

BRICK PLANT RUNNING BOTH DAY AND NIGHT.

One of the busiest places in Clinton county at present is the Pennsylvania Fire Brick Company's plant at Beech Creek, Pa. This company now has 190 persons on its pay roll and is running the plant day and night to its fullest capacity to meet the demand for its products. The reputation of the Pennsylvania Fire Brick Company for making high-grade hand-made brick is well established, and orders are already booked ahead for several months. The company owns a large body of some of the finest clay lands in this section, and besides this has control of other fine clay on a royalty. This gives it practically an unlimited amount of clay and will enable it to maintain its record for first-class brick in the market indefinitely. The company numbers among its customers some of the largest concerns and corporations in the United States.

BRICKMAKERS DEMAND A SHARE OF THE TRUST GRAB.

Claiming that a "brick trust" exists in Denver, which is forcing the price of brick up, while wages remain the same, fifty brickmakers employed by the Keefe Manufacturing Company refused to go to work. Unless an increase in wages is granted, it is said that all of the brickmakers in Denver—500 of them—will strike.

The cause of the trouble is the rise in the price of brick from $4.50 to $5.50 and from $5.50 to $6.50 per 1,000. As soon as this increase was put in effect the brickmakers demanded an increase of 25 cents a day in wages.

This the employers have refused to grant, and J. A. Keefe, one of the largest manufacturers in the city, said that under no circumstances would the employers yield.

The union men have been receiving from $1.50 a day for helpers to $2.50 for skilled men. They declare that there is a combine among the manufacturers, and that when the price of brick was raised without an increase in cost they were entitled to a corresponding raise in wages.

HAULING BRICK BY ELECTRIC RAILWAY.

The Detroit, Ypsilanti, Ann Arbor & Jackson Electric Railroad is losing no time in seizing opportunities to increase its scope of action. Having put on limited fast cars between Detroit and Jackson, which at once became popular enough to earn over $300 a day, the road went a step farther and inaugurated through package freight service whereby Detroit merchants could ship goods to Jackson, Kalamazoo, Battle Creek and way points. This having proved a success, General Manager J. P. Clark conceived the idea of inaugurating a general freight service, handling goods in car load lots. For that purpose specially designed motors were constructed and flat cars built, all equipped with air brakes. The train will be made up of four cars and the motor 300 horsepower. The number of cars is thus limited because of the necessity of making speed and keeping out of the way of the passenger cars. At present no attempt has been made to bring this traffic into Detroit proper. The start, however, was made when a train of four cars went out of one of the west end brick yards loaded down with forty tons of brick on each car. These were taken to Kalamazoo. Contracts have already been made by the Detroit, Ypsilanti, Ann Arbor & Jackson to handle between 4,500,000 and 5,000,000 brick this summer to such places as Ypsilanti, Ann Arbor, Jackson, Kalamazoo and Battle Creek.

NEW BRICK CONCERN IN CONNECTICUT.

The brick manufacturing plants of the Fishers Island Brick Company at Fishers Island, and of A. C. Griffing at Sag Harbor have been leased to the Long Island & Fishers Island Brick Company of New London, Conn., and operations at both plants will be pushed. The Long Island & Fishers Island Brick Company has just been formed with a capital stock of $50,000. A. C. Griffing of Sag Harbor is president and Charles B. Waller of New London secretary and treasurer.

NEW YORK BLOWER CO.'S No. 61 CATALOGUE.

The New York Blower Company has issued a circular, No. 61, pertaining to the Blackman style of propeller fan. It shows these fans with pulley and direct connected motor and gives all desirable information about them. Especially valuable is the table giving capacities and horsepower.

If interested in these or any other style of fans, write to the New York Blower Company, 25th Place and Stewart Ave., Chicago.

FINAL REPORT OF EXPOSITION NOW BEING MADE.

The final report on the Clay Industry exhibit at the St. Louis World's Fair is now being prepared by Prof. H. A. Wheeler. This report will be incorporated with the Mining Department report that will be one of the series that is being prepared for publication by the Government. This clay report will cover the history of this original exhibit as well as a description of every exhibitor therein. When published, copies can be obtained on application through your congressman, and the complete report on the St. Louis Exposition will probably comprise ten or more volumes.

THE ROSS-KELLER CO. INSTALLING SAND-LIME BRICK PLANTS.

The Ross-Keller Triple Pressure Brick Machine Co. have closed a contract with the Plant City Granite Brick Co. of Plant City, Fla., for a double sand-lime brick plant, consisting of two four-mold Ross-Keller presses, and a full equipment of grinding and mixing machinery. The buildings are now under construction and the installation of the machinery will be begun in the course of a few weeks. The Plant City Company have a large deposit of white sand, which when treated under the Ross-Keller process will produce a high-grade white sand-lime brick.

ASBURY PARK, JULY 3 TO 7.

The most attractive eastern excursion during the coming summer will be to Asbury Park, N. J., on occasion of the Annual Meeting of National Educational Association, July 3rd to 7th, inclusive, via the Nickel Plate Road and its connections—either the West Shore or Lackawanna Road—with privilege of stopover at Chautauqua Lake points, Niagara Falls and New York City. Rate $21.35 for the round trip. Dates of sale, June 29th and 30th and July 1st and 2nd, with extreme return limit of August 31st, by depositing ticket. Patrons of this route may have the choice of a ride over the most interesting mountain scenery in New York and Pennsylvania, and through the celebrated Delaware Water Gap, or through the beautiful Mohawk Valley and down the Hudson River, which also includes the privilege of a ride on day line boat on Hudson River, between Albany and New York City, in either direction, if desired. No excess fare charged on any train on Nickel Plate Road. Meals served in Nickel Plate dining cars, on American Club Meal Plan, ranging in price from 35c to $1.00; also a la carte. Chicago depot, La Salle St. Station, corner Van Buren and La Salle Sts. City ticket offices, 111 Adams St. and Auditorium Annex.

For further particulars, address John Y. Calahan, General Agent, 113 Adams St., Room 298, Chicago.

POTTERY NEWS ITEMS.

The Norse Pottery Co., South Water St., Rockford, Ill., under the management of A. W. Wheelock, is being enlarged.

The C. B. Upjohn Pottery Co., Zanesville, Ohio, has been reorganized. J. H. Whartenby is president and general manager.

A sanitary pottery is to be added to the Florentine Pottery at Chillicothe, Ohio, Hon. F. C. Arbenz having charge of this end of the deal.

Daniel. P. Shenfelder's pottery at Reading, Pa., has been sold at auction, the business having been discontinued. The plant was established in 1862.

James V. Richey has sold the Marshalltown, Iowa, Pottery Co. to P. B. Woolson, of Toledo, Ohio, who will become the manager in a short time.

The Summit China Co., Akron, Ohio, will move their plant to Gadsden, Ala., and re-incorporate under a new name. Five hundred thousand dollars will be expended.

The North American Mfg. Co., owner of Newell, W. Va., opposite East Liverpool, Ohio, has decided to construct a 30-kiln pottery. The new industry will be a million-dollar enterprise.

The Harley Pottery Co., Nashville, Tenn., are building a large factory building and adding a large quantity of pottery machinery. An "opening" will be given by the management soon.

The Trenton (N. J.) Potteries Co. have purchased the "Sandy McDowell" Pottery at Quebec, Canada, and has sent large shipments of clay and pottery machinery to operate it. More kilns are being built.

John O. Hankins, formerly manager of the Palouse (Wash.) Pottery Co., and a heavy stockholder, has sold his interests and assumed the management of the Spokane Pottery Co., at Clayton, near Spokane.

The Columbus (O.) Pottery Co., located at Chaseland, near Worthington, O., is being started up. Herbert Goodwin, formerly superintendent of the Thompson Pottery at East Liverpool, is the superintendent.

THE NEW MARTIN CATALOGUE.

The Henry Martin Brick Machine Mfg. Co., of Lancaster, Pa., are now sending out to the trade their new catalogue, No. 90. It is one of the largest and most complete catalogues that is sent out by anyone in the clayworking trade. Full of good information and complete to the smallest detail.

All kinds of brick machinery made by this well-known concern and plans of different capacity plants are illustrated. If you are not in possession of one of them now, you can have one by writing to the address above. To those interested they are free for the asking.

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Bodine & Davis, Putney, Vt., have started up their new brick machinery, making a test run.

SAND OR LIME-BRICK OR BLOCK NEWS.

The Manistee (Mich.) Brick Co. are running night and day to keep up with orders.

The Jonesboro (Ark.) Sand Cement Brick Co. has been chartered, with $10,000 capital stock.

Frank Judy, Mackinaw, Ill., contemplates the manufacture of concrete blocks at his brick yard.

J. W. Smith, of Chanute, Kan., is to locate a brick plant at Wichita, to be called the Wichita Crystal Brick Co.

The Chamber of Commerce of Astoria, Oregon, are considering the building of a sand-lime brick plant in that city.

John F. Martin, Arthur, Ill., has ordered the machinery and is now erecting the buildings for a concrete block factory.

John Lauters and others, of Fredonia, Wis., are building a plant that will cost $10,000 for the manufacture of cement brick.

Chas. H. Felton's sand and cement brick factory at Michigan City, Ind., is now running and turning out a fine grade of brick.

The Wichita (Kan.) Silica Brick Co. made 2,000,000 sand-lime brick last season, and will double the capacity of their plant this year.

The Janesville (Wis.) Granite Brick & Stone Co. are now completing their plant as fast as possible. Sand-lime brick by the Huennekes process will soon be made.

The Kankakee (Ill.) Sand Brick Co. is being organized; $40,000 has already been subscribed. The plant will be on the property of Dr. Bergerson, west of the city.

The Ida Grove (Iowa) Concrete Co. has ordered machines for making brick and in a short time will be turning out hard pressed concrete brick of the ordinary size.

The Menominee (Mich.) Brick Co.'s plant will be ready for work by the middle of June. The plant is being furnished by the American Sand-Lime Brick Co., of Chicago.

The Harper Brick Co., Harrison, N. J., has been incorporated to make artificial and other materials, with $100,000 capital stock. Incorporators are David Harper, Amos H. B. Harper and Edward A. Van Wagener, all of Newark, N. J.

The Tri-City Sandstone Brick Co., Moline, Ill., recently organized, with $60,000 capital stock, has elected the following officers: E. E. Morgan, president; A. L. Moore, vice-president; C. E. Dietb, secretary and treasurer. The plant is making 27,000 brick daily, but will shortly double its capacity.

The Otis Sand-Lime Brick Co., New York, has been incorporated, with $100,000 capital stock. Incorporators are Lauren Ingels, 116 Nassau St.; Henry S. White, 127 South St., Brooklyn; Leonard Vogel, 235 W. 116th St.; Edward S. Egolf, 373 Fulton St., Brooklyn; John G. Miller, 43 Leonard St., New York.

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S. T. Dunlap has started work preparatory to the opening of a brick plant at Julietta, Idaho.

MISCELLANEOUS ITEMS.

A brick yard is to be opened up at Towner, N. Dak.

G. A. Johnson will open a brick yard in Miltona, Minn.

M. C. Stolze, Ireton, Ia., will operate the brick yard this year.

J. M. Garrett and W. B. Perdue will start a brick works at Elba, Ala.

L. D. Littleton and others have organized the Guin Brick Co., Guin, Alabama.

Gust. Voelcker has leased the Mass City, Mich., brick works and will operate same.

Frank P. Birrer has located his brick yard on the Selway ranch, north of Dillon, Montana.

Collins Bros., of Pittsburg, have completed arrangements for a large brick making plant at Somerset, Pa.

A. G. McMullen & Son, Kewanee, Ill., are building a plant for the manufacture of 60,000 brick daily.

The North Branch Brick & Cement Co., Pierpoint, S. Dak., has been incorporated, with $300,000 capital stock.

The Mills Land & Loan Co., have bought the Sioux Rapids (Ia.) Brick & Tile Works, and will enlarge and operate same.

Grim Bros., South Allentown, Pa., are rebuilding the plant that burned last November. The Martin Machinery will be used throughout.

The last Illinois assembly passed a bill appropriating $10,000 for the establishing of a drain tile plant at the Chester (Ill.) Penitentiary.

The Kirkpatrick Brick Co., Greensboro, N. C., has been incorporated, with $50,000 capital stock, by D. A. Kirkpatrick and others, of Greensboro.

The Chattanooga (Tenn.) Sewer Pipe & Fire Brick Co. has been incorporated, with $200,000 capital stock, to take over the Montague & Co. interests.

The Hoosier Supply & Brick Co., Indianapolis, Ind., has been incorporated, with $10,000 capital stock, by Edward W. Felt, John J. Johnson and Samuel R. Waters.

Henry Hess has bought the interest of his partner, Mr. Moog, in the St. Cloud, Minn., yard which has been run for many years under the name of Hess & Moog.

The Chillicothe (Mo.) Brick & Tile Co. has been incorporated, with $6,000 capital stock, by Oscar L. Smith, W. O. Grace, J. R. Slifer, A. Lownstein. and others.

The Stommel Brick & Investment Co., Denver, Colo., has been incorporated, with $15,000 capital stock, by Frederick Stommel, A. W. Stommel, and Wm. Hill, of Denver.

The Glascock Kaolin Co., Augusta, Ga., has been organized, with $20,000 capital stock, by J. Newsome, W. V. Usry and W. F. Thompson. The plant will be at Gibson.

Arthur Buckingham, manager of the Northern Pressed Brick Co., Crookston, Minn., has moved his family to Crookston. The machinery for the plant is being installed rapidly and will soon be turning out first-class dry pressed brick.

Dye & Meek have bought the Peru (Neb.) Brick Works from Glasgow & Whitfield, $4,000 being paid for same.

Tolle Anderson, Issaquah, Wash., is having clays tested that have been found in that town, with a view of starting a brick and tile plant.

J. F. McConnell, Ironton, Ohio, has found a fine grade of clay on his land in Scioto county, and is trying to interest parties to build a clay plant.

The McArthur-Neill Company, Chicago, has been incorporated, with $4,500 capital stock, to manufacture brick, etc., by Henry Busse, Fred W. La Bahn, and Louis Reiner.

The Versailles (Mo.) Fire Brick & Clay Mfg. Co. has been sold to B. E. LaDow and F. E. Wier, of Kansas City; L. S. Skelton, of Fredonia, Kansas. F. A. White will manage the plant.

The Speer Clay Mfg. Co., Vanport, Pa., has been sold to W. S. Miller, of Pittsburg, and Albert E. Hummel, of Bellevue, the consideration being $65,000. The new owners will operate the plant.

The Center Point (Ind.) Brick Works has been incorporated, with $20,000 capital stock. Directors are L. C. Kennedy, C. W. Mace, P. L. Lancet, R. L. Kennedy, John Clifton and Charles Clifton.

The Half Moon (N. Y.) Brick Co. has been incorporated, with $45,000 capital stock, by C. H. N. Wheeler and E. S. Wheeler, of Waterford, and C. G. Eddy, J. W. Clark and A. P. McKean, of Troy.

The Union Brick Mfg. Co., Brookhaven, Miss., has been organized by Dr. H. E. Conner, P. D. Gullage, H. S. Harvill and G. N. Hilson, leading negroes. A site has been bought 2 miles north of town and operations begun.

Alfred Greenaway, New Albany, Ind., is at the head of a company for the manufacture of dry pressed enameled brick. He has bought land east of Galt street, along the Ohio River, and will erect and equip a plant at once.

The Pittsburg & Buffalo Co., of Cleveland, O., has been incorporated, with $10,000 capital stock, by Charles F. Long, W. A. Greenlund, F. A. Robinson, B. A. Long and Peter Grob. Sewer pipe and kindred products will be made.

The Peabody Clay Co. has been incorporated, with $500,000 capital stock, by Lawrence Rukeyser, Edmund Parker and Jacob J. Talbott, of New York City, and Alvin N. Itterly and Lewis Grether, of North Tarrytown, N. Y.

The Minden (Neb.) Brick Works have just completed a 50,000 brick daily capacity plant. Dr. H. Hapeman is president; Noel Milbourn, vice-president and manager; Geo. F. Milbourn, secretary, and R. S. Trumbull, treasurer.

The Shawnee (O.) Flash Brick Co., of Columbus, O., has been incorporated, with $125,000 capital stock. Incorporators, Chas. M. Ross, E. C. Hecox and F. Mitchler, of Columbus, and John I. Davis and G. C. Davis, of Shawnee.

The Standard Clay Co., North Industry, O., has been incorporated, with $25,000 capital stock, by Elmer E. Acker, Dr. C. T. Hill and C. W. Meyers, of Akron; W. H. Fendenheim, of Barberton, and W. R. Shanefelt, of New Berlin.

Captain Wright, Culdesac, Idaho, has found clay that will make a splendid brick, and has ordered machinery to make 20,000 daily.

Mayor W. H. King of St. Johns, Oregon, has received his brickmaking machinery and is now making 20,000 brick per day for the trade.

It has finally been decided, after severe tests, that Geo. W. Songer, of Hoopston, Ill., and others, will build a brick and tile factory at Rosenberg, Texas.

The Co-operative Brick Co., Terre Haute, Ind., has been incorporated, with $2,000 capital stock, by E. M. Akers, Hamilton Taylor and Jacob Myers.

The Fowler Bros., of Fowlerton, Ind., have had to change from gas to coal for fuel, which necessitates the rebuilding of the kilns and changing the furnaces.

The Rockwood (Tenn.) Brick & Tile Works has installed new and up-to-date machinery and has greatly increased the capacity of its plant. E. B. Shadden is the superintendent.

The Lone Star Press Brick Co., Ferris, Texas, has been incorporated, with $24,000 capital stock, by T. G. Cole, J. A. Carpenter, I. Jolerck, J. C. Mallory and J. S. Wilson, all of Ferris.

The Victor Brick Co., Pittsburg, Pa., has been incorporated, with $30,000 capital stock. Directors are William W. Guy, Oakmond; James H. Welch, Monaca, and Edward G. Nevergold, New Brighton.

The Cheney (Wash.) Brick, Tile & Mfg. Co. have started their new plant, making 2,500 brick per day. J. S. Hull is president; F. A. Pomeroy, vice-president; C. C. Richardson, secretary; F. M. Martin, treasurer, and J. A. Ward, superintendent.

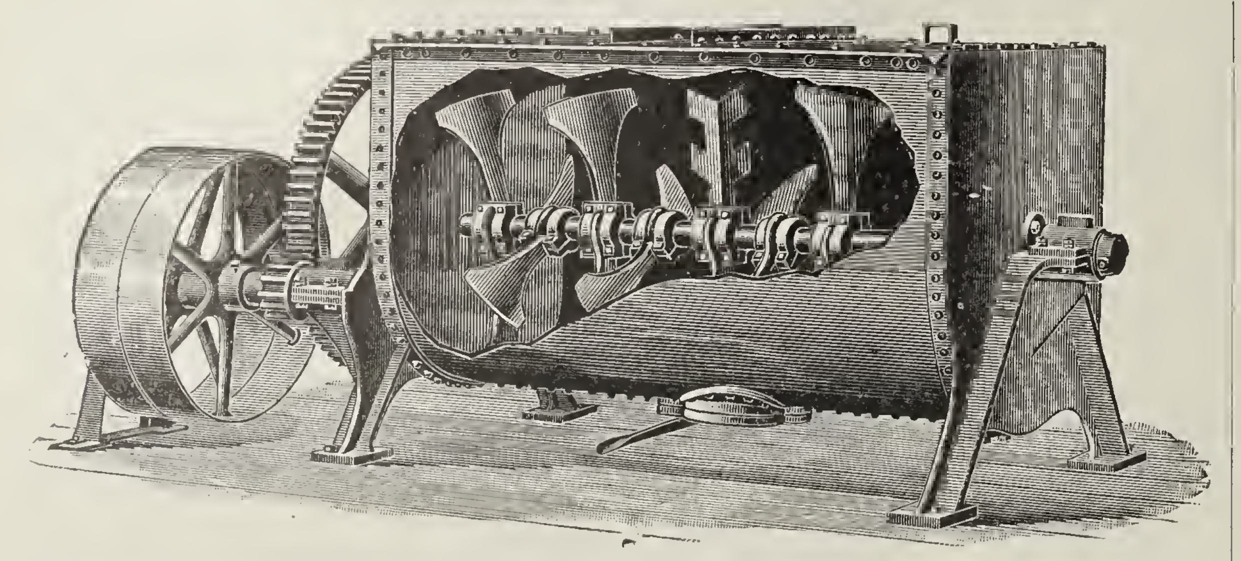
The Rosenhayn Face Brick Co., Rosenhayn, N. J., has been incorporated, with $25,000 capital stock, by A. W. Barnes, 9th and Walnut streets, Philadelphia, Pa.; Charles F. Eggleston, 21 So. 12th street, Philadelphia, and James D. Cox, Bridgeport, N. J.

The Madison (Ark.) Brick & Tile Co. has been incorporated, with $5,000 capital stock, by Forrest City and Madison business men. Capt. J. G. Stern is president; J. D. Baugh, vice-president; Col. S. E. Sweet, manager, and Capt. James Fussell, treasurer.

The Idaho Brick Co., Lewistown, Idaho, has been incorporated, with $50,000 capital stock. The incorporators are C. F. Allen, L. L. Haynes, A. R. Haynes, C. V. F. Taylor and E. D. Thomas. They will install a complete line of Boyd machinery.

The Standard Clay Co., of North Industry, and composed of Akron capitalists, has been incorporated, with $25,000 capital stock. The incorporators are E. E. Acker, Dr. C. T. Hill, and C. W. Myers of Akron, W. H. Fendenheim of Barberton and W. R. Shanefelt of New Berlin.

The Besley Brick Co., Council Bluffs, Iowa, has been incorporated, with $35,000 capital stock, by R. W. Beasley, president; L. C. Beasley, secretary and treasurer, and C. A. Beno, vice-president. They will take over the business of L. C. Beasley and put in a dry pressed brick plant.



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BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

FOR SALE.

A good established brick yard, in a city of 40,000 inhabitants, in Illinois. Plenty of clay, and can sell all the brick that can be manufactured. Good reason for selling. For particulars, address

S., care Clay Record,
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FOR SALE.

Brick and tile plant. Stiff Mud. Continuous kilns. Steam dryer. Good clay and excellent market.

D. W. TOWNSEND,
Cherokee, Iowa.

FOR SALE.

One J. D. Fate A Special Auger Machine, 40,000 brick per day. In first class working order.

REDFIELD BRICK & TILE WORKS,
Redfield, Iowa.

FOR SALE.

20,000 fine pallets. $30.00 per thousand, F. O. B. cars here.

JOHN BUCKLEY,
Frankfort, Ky.

FOR SALE.

For sale, reasonable, in condition—

One 5x18 foot Horizontal Tubular Boiler.
One No. 20A Penfield Hollow Brick Machine.
One 14 foot Pug Mill.
One Disintegrator,
One 40 foot Clay Conveyor, with 20 foot belt.
Forty Fire-proofing Dies, with two extensions, pullys, clutches and belting.

Reasons for sale, are making different ware.

R. 611, W. 51st St.,
New York City.

FOR SALE.

For sale—An up to-date brickyard, land and all machinery, at Buchanan, Mich, on the Michigan Central Railway. Can be run by steam or electricity. Owing to the fact that it is owned by a woman who is unable to run it, it can be sold at a bargain.

SCHULZ & PIXLEY,
St. Joseph, Mich.

FOR SALE.

A 20,000 capacity brick and tile plant, located in good Michigan town. Has Stewart patent kilns, plenty of drying sheds, all machinery in good condition, fine clay, good market, established business. Price very reasonable. Address

MICHIGAN,
Care Clay Record, Chicago, Ill.

Machinery For Sale.

FOR SALE.

50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets Track gauge 25 Inches.
Both styles of cars in first-class repair.

ATLAS CAR & MFG. CO.
Cleveland, Ohio

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine. Address

"GIANT,"
Care Clay Record, Chicago

FOR SALE CHEAP.

One Steam Power Soft Mud Brick Machine.
15,000 feet of one-inch Pipe.
100 Single Deck Cars, with pallets for soft mud.
25,000 Pallets and Racks for same for outside drying.
Three Transfer Cars.
One Centrifugal Pump, with cable transmission.

O. W. DUNLAP,
Bloomington, Ill.

FOR SALE—CHEAP—1200 Steel Crimped Pallets. 10x34 inches. Address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—New and re-laying rails, 12, 16, 20 and 25 pound. For prices, address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE.

Four-Mold Dry Press, absolutely as good as new, made only one kiln of brick. Can sell for less than half original price. Address

"DEALER," care Clay Record.

FOR SALE.

One Conical Smooth Roll Crusher No. 25, Style "F," manufactured by American Clay Machinery Co., Bucyrus, O. One No. 5 board delivery side-cut Brick Table. This table has never been used. For information, write

STRAIGHT BROS.
Fonda, Iowa.

WANTED.

A brick and tile plant in exchange for a good Iowa or Illinois farm. Address

FARM,
Care Clay Record, Chicago, Ill.

WANTED.

An experienced brick and tile man to superintend a number of brick plants. One who can make a financial investment preferred. Address

IOWA,
Care Clay Record, Chicago.

Do Your Brick Turn White?

HERE IS THE REMEDY.

PRECIPITATED

Carbonate K.B. C.F.H. **of Barytes**

The only preventative for scum and discoloration on facing Brick and Terra Cotta; neutralizing the Sulphate of Lime in the Clay and Water.

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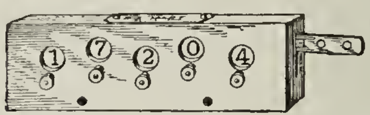


No better made, cut from $8 and $10, to
4 Wheel, $3.00
5 Wheel, $3.25
Guaranteed.

Paper Joggers quoted. Sold by all dealers.

R. A. HART, 41 White St., BATTLE CREEK, MICH.

WANTED.

A second-hand three-mold Andrus Press, in good condition. Prefer only Andrus type, as I am already using one on my yard. In naming price give length of time used and present condition.

CHEAP, care Clay Record,
Chicago, Ill.

WANTED.

To buy or lease a brick plant. Must be situated in Pennsylvania, Ohio, West Virginia, Kentucky, Indiana, Michigan or Illinois, and have shale or fire clay raw material.

573, care Clay Record,
Chicago, Ill.

FOR SALE.

Drain Tile and Brick Plant for sale. Good machinery. Good location. Plenty of clay. Price $2300, small payment down, long time on rest. Wil take product as pay. Address

CONTINENTAL,
Care Clay Record, Chicago.

FOR SALE.

One No. 4 Double Mold Brick Repress, made by The American Clay Working Machinery Co. Price $125.00.

REPRESS, care Clay Record,
Chicago, Ill.

$25 **FOR SALE.** Enquire about our combination offer. Patent Brick and Tile Kiln and Patent Grateless Furnace. 40 per cent fuel saving. Next best thing to continuous kiln.

PLATT PATENT KILN CO.,
Box **Van Meter, Iowa.**

FOR SALE.

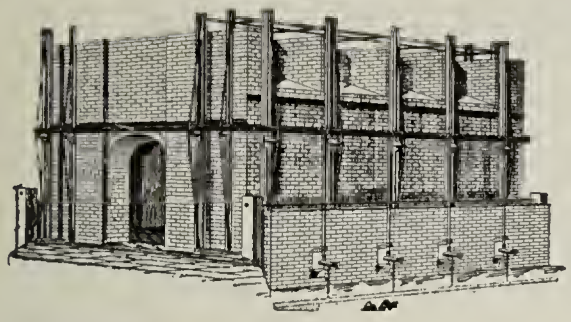
Three 72 Chamber Presses, with rubber gaskets and sacks
One Vertical Double Belt Clay Pump.
Two Steam Clay Pumps.
Two Clay Washers.
All the above machinery used only a short time, and is as good as new. Address

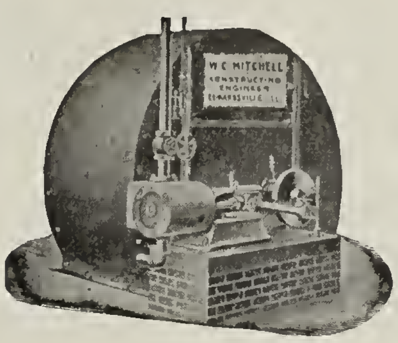
M. S. COMPANY,
Care Clay Record.

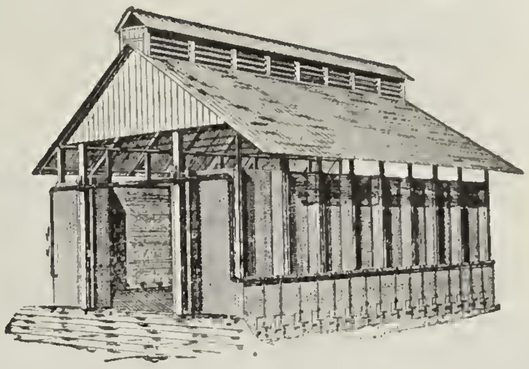
ENGINES AND BOILERS.

New and rebuilt Slide Valve and Automatic Engines, from 3 to 200 h. p. Boilers of all types, from 5 to 150 h. p. All of our rebuilt machinery is thoroughly overhauled in our own shops by competent mechanics and modern tools. We are now offering some special bargains. Send us specifications to your requirements.

THE RANDLE MACHINERY CO.
1732 Powers St., Cincinnati, Ohio.







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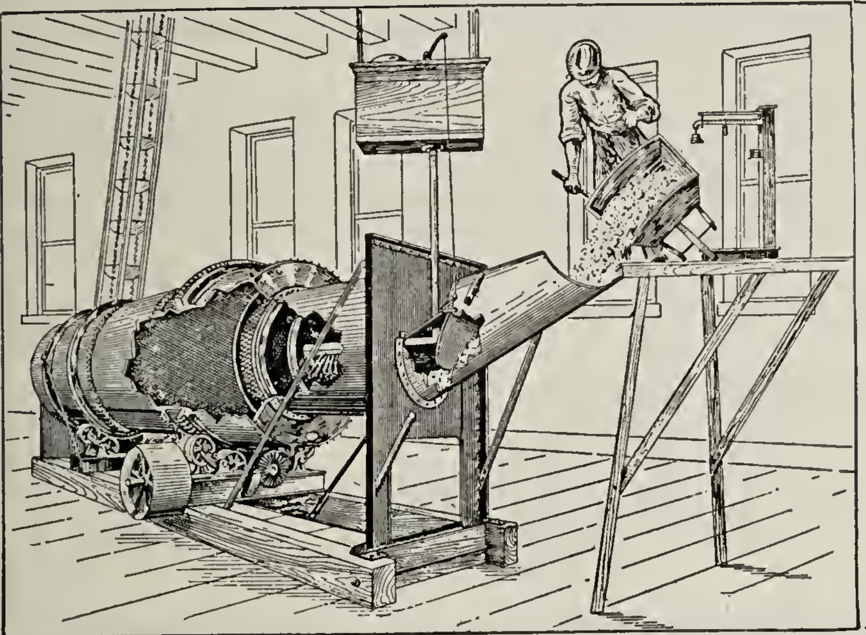
Consulting Engineer of Clay Plants, EDWARDSVILLE, ILL.



HYDRATE YOUR OWN LIME

By the Cheapest and Best Process in Existence.

AUTOMATIC FROM BEGINNING TO END.

The only requisite being the weighing of each wheelbarrow of lime before dumping it into the machine.

The HYDRATOR, as the machine is called, will do the rest.

No grinding, no separating. no free lime.

The lime as it comes from the kilns is fed the machine, the powdered hydrate—freed from all impurities, flows from the discharge end

The process is continuous.

The capacity from one to ten tons per hour, depending upon size of machine.

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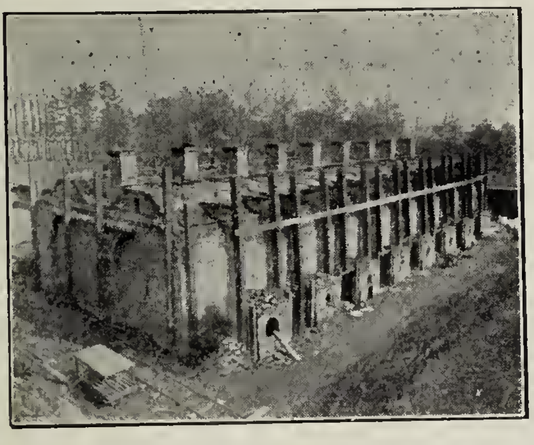

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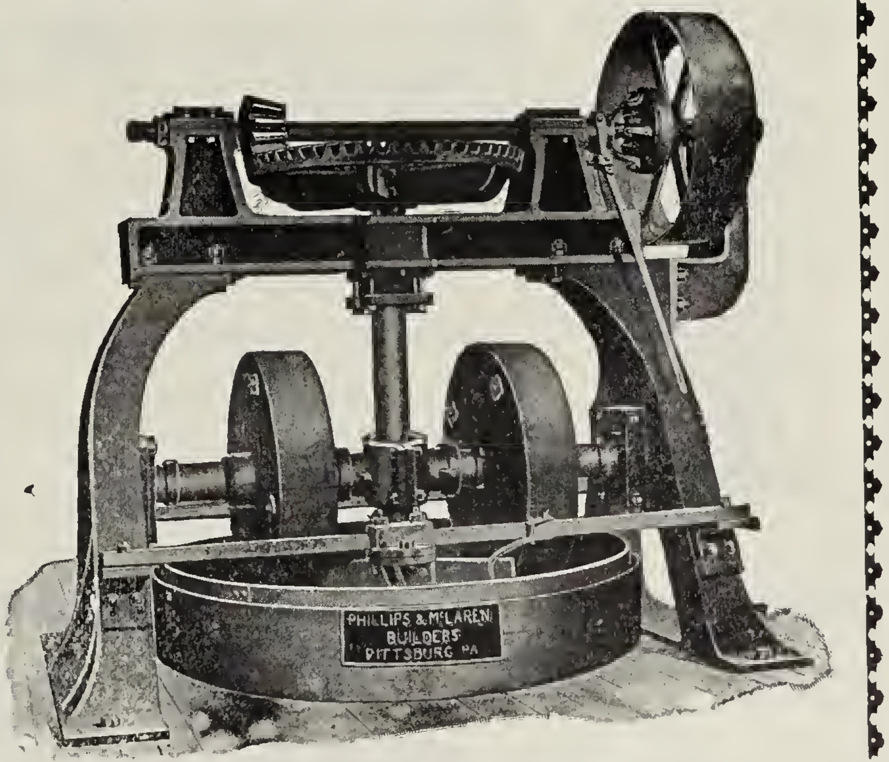

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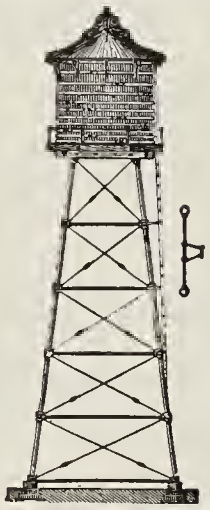

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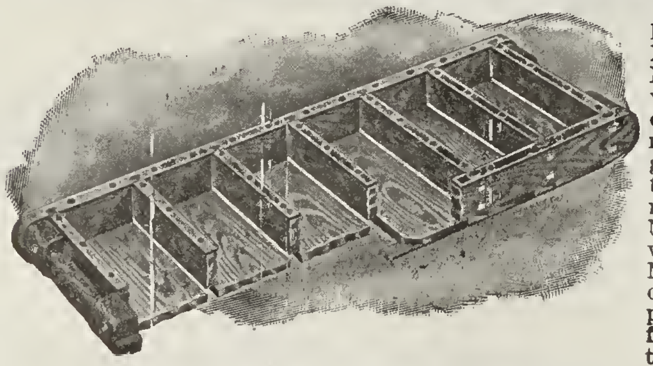

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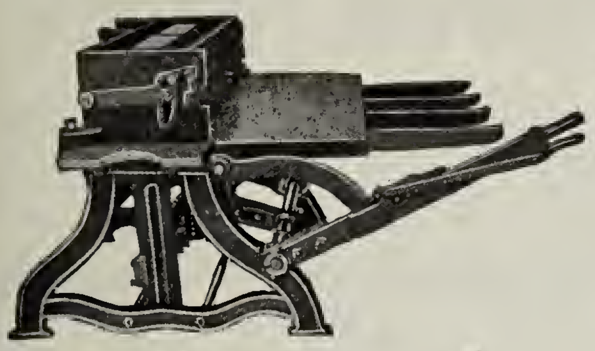

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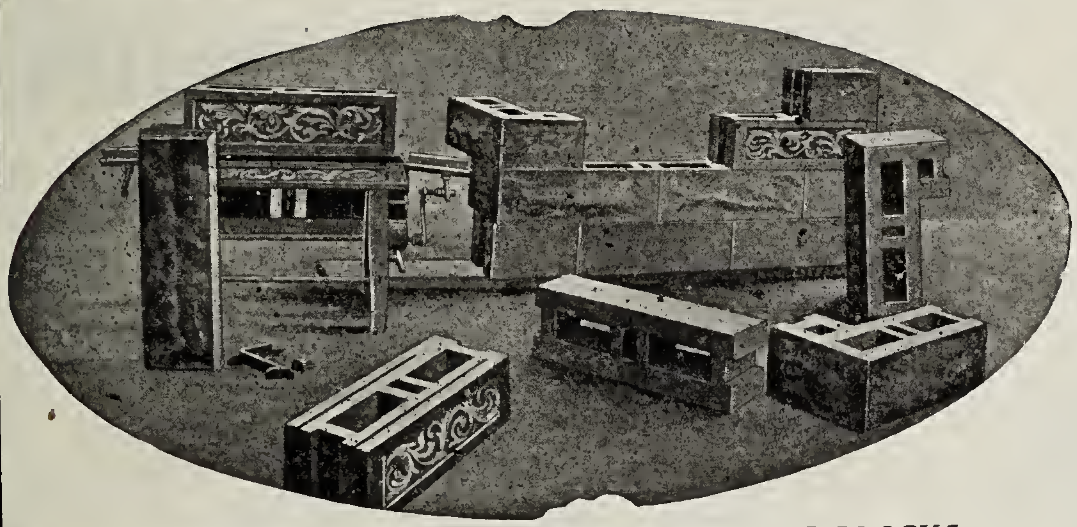

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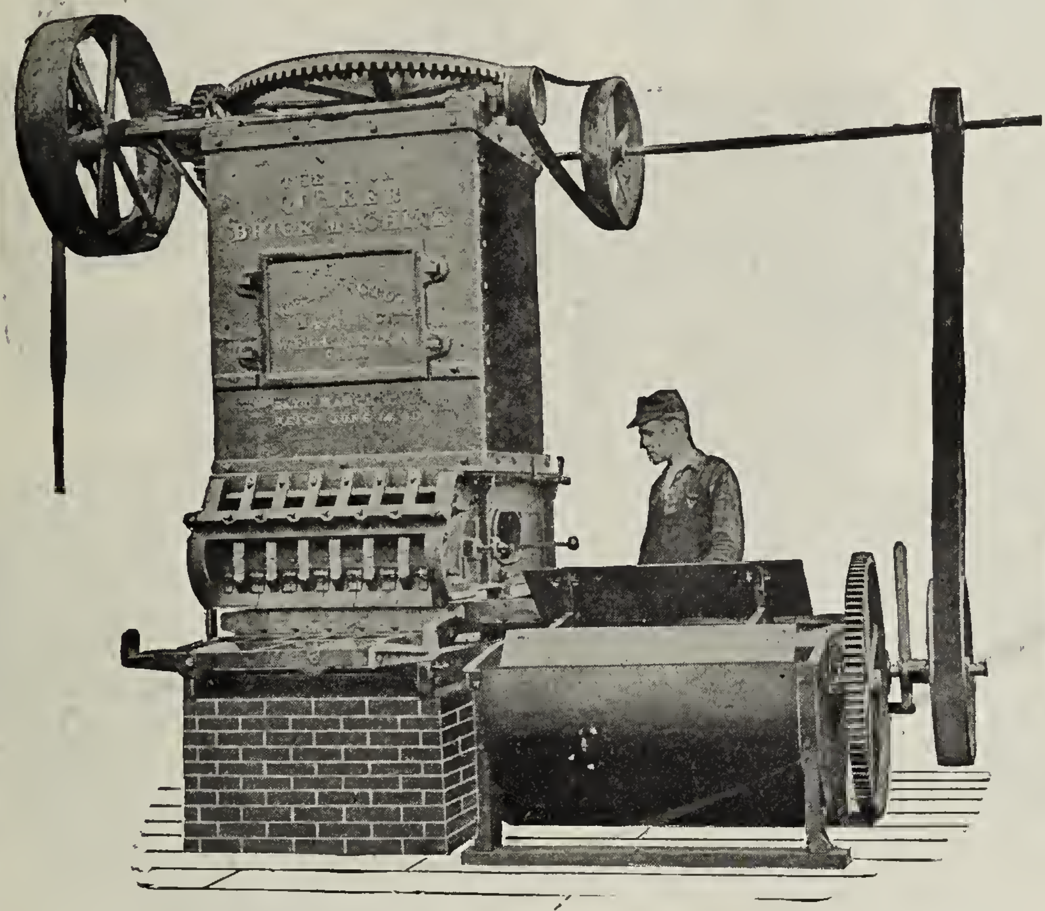

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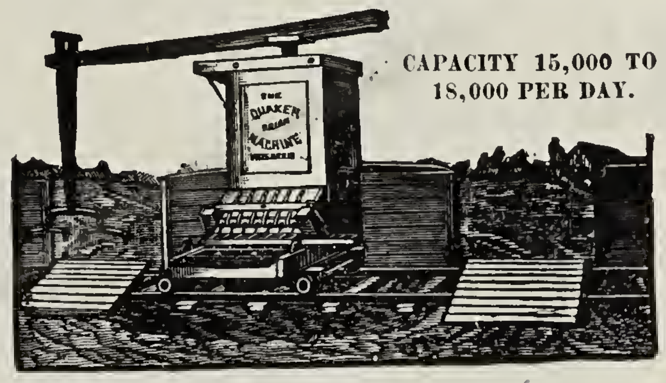

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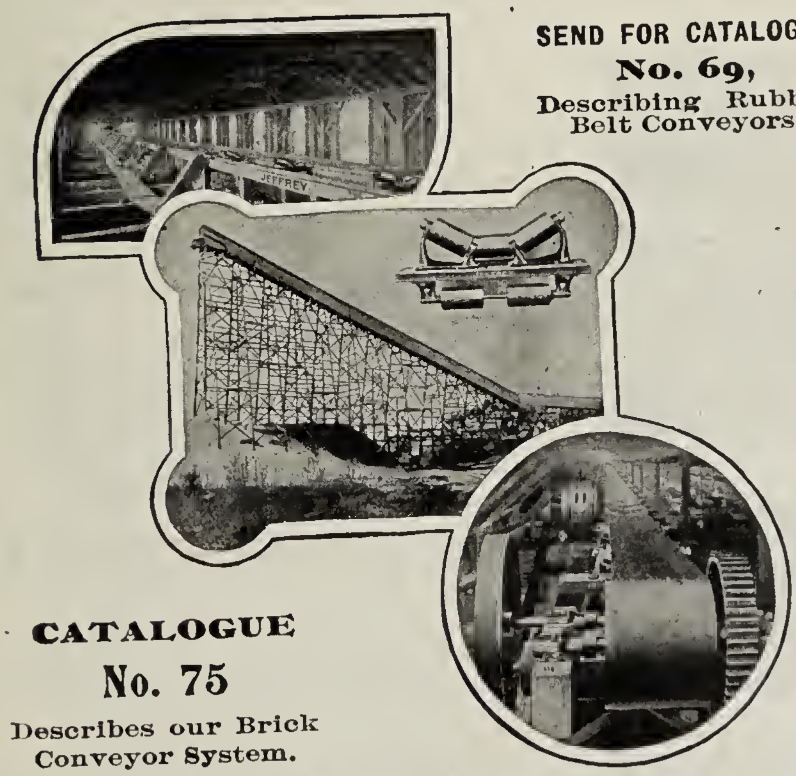

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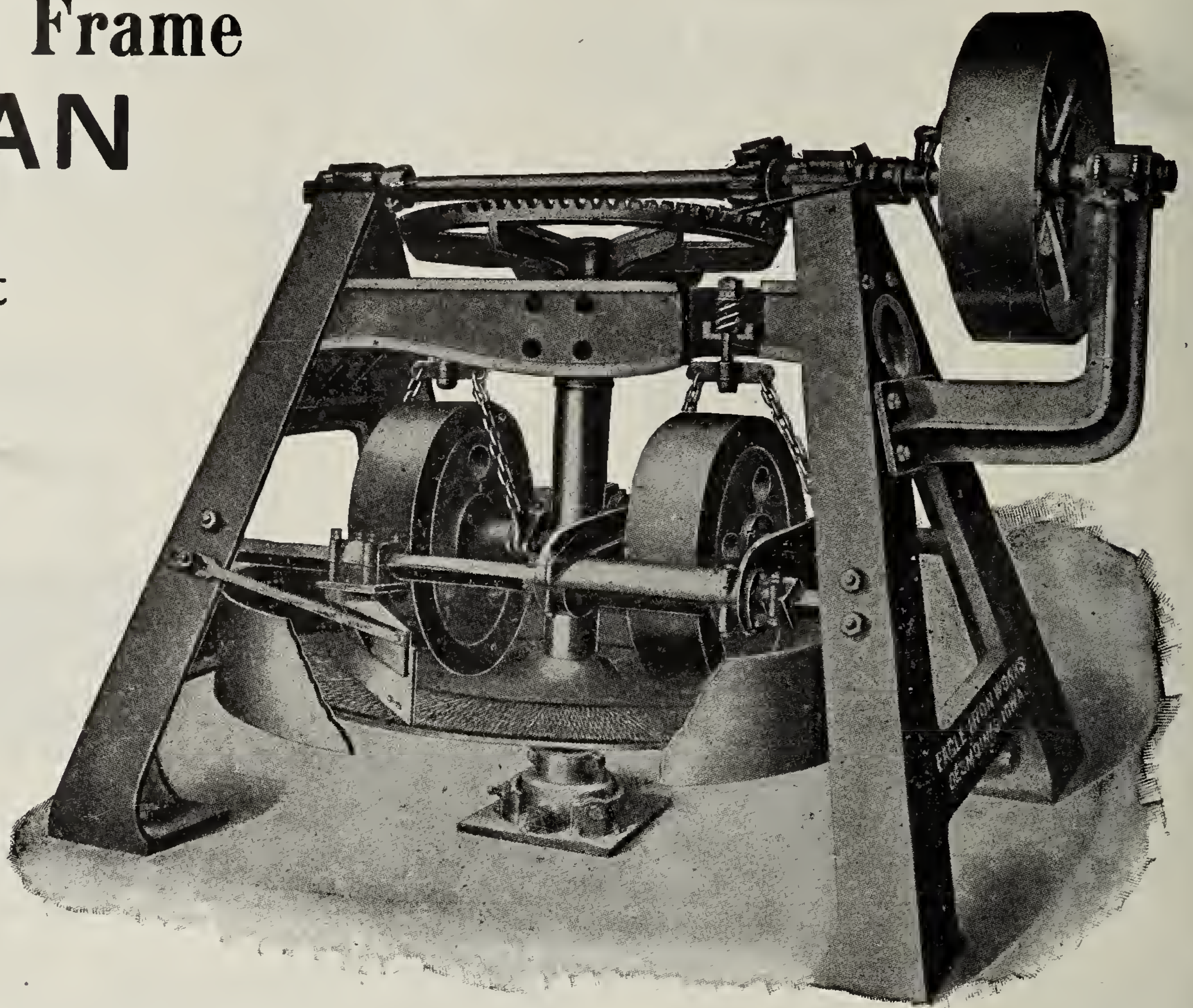

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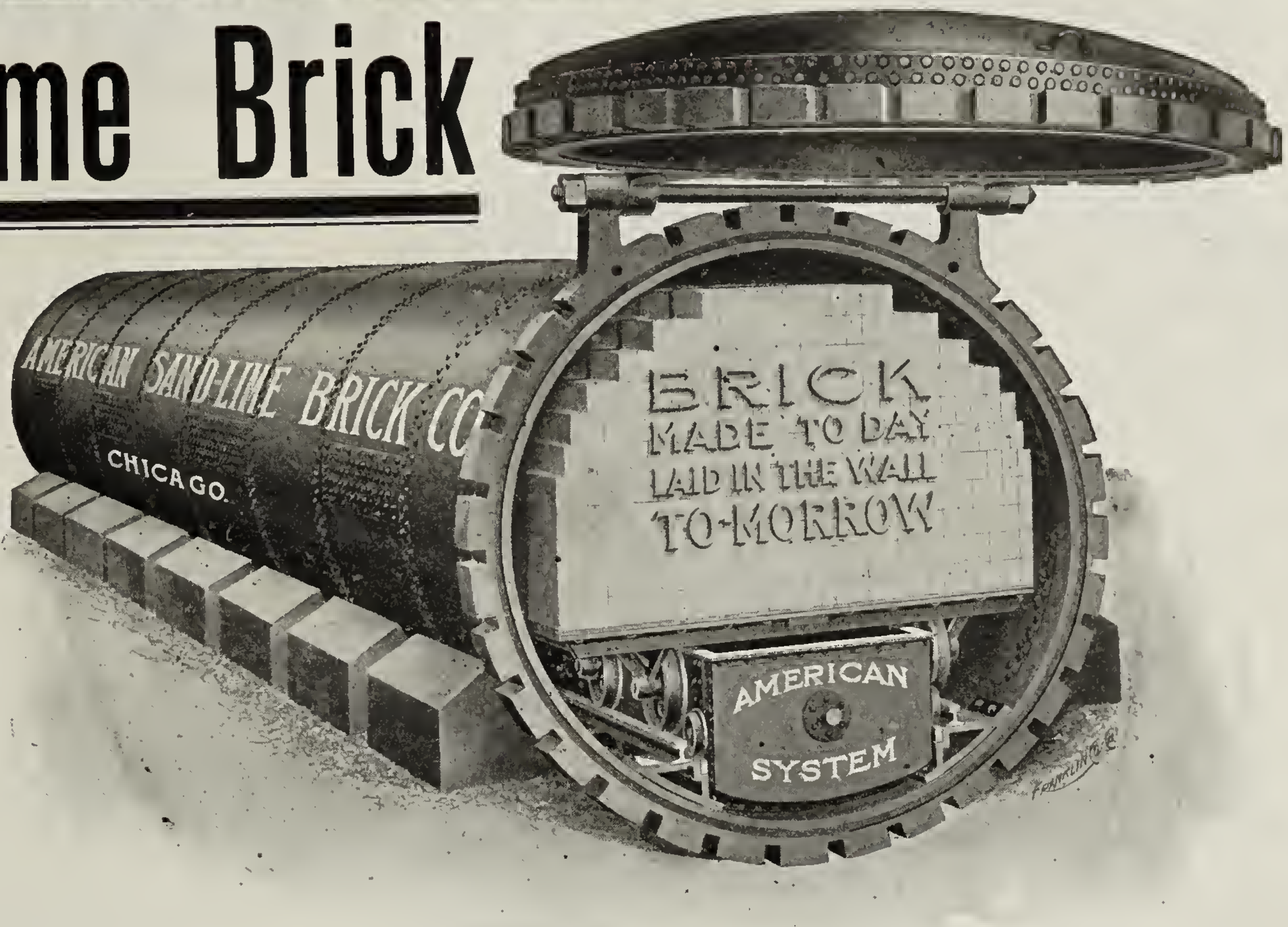

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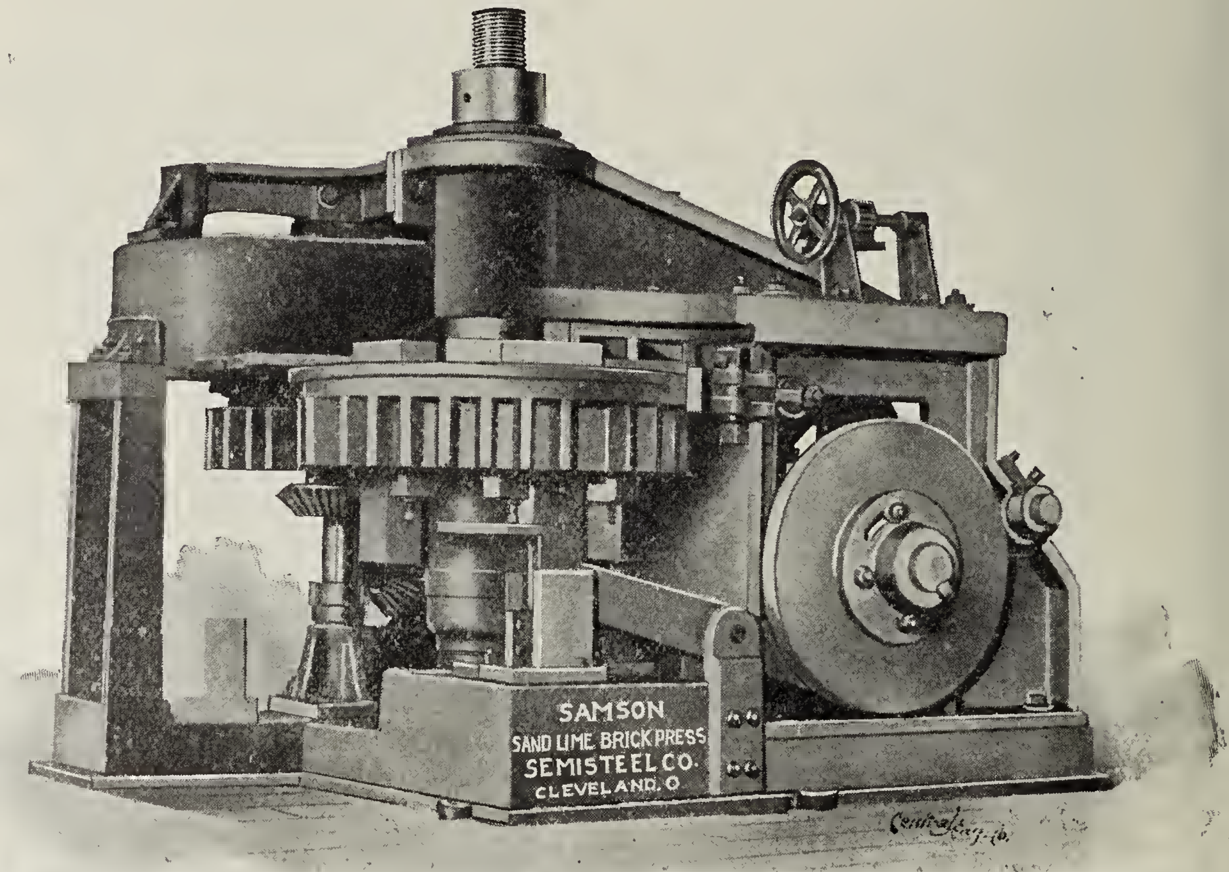

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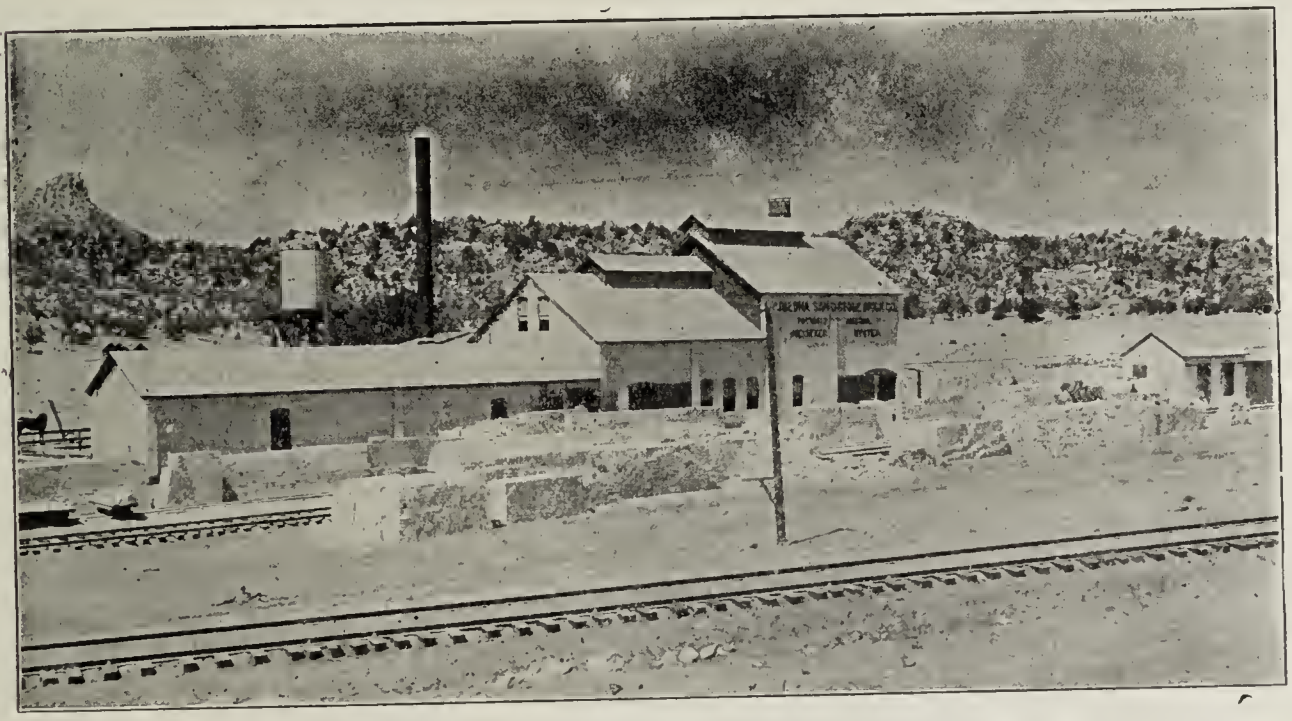

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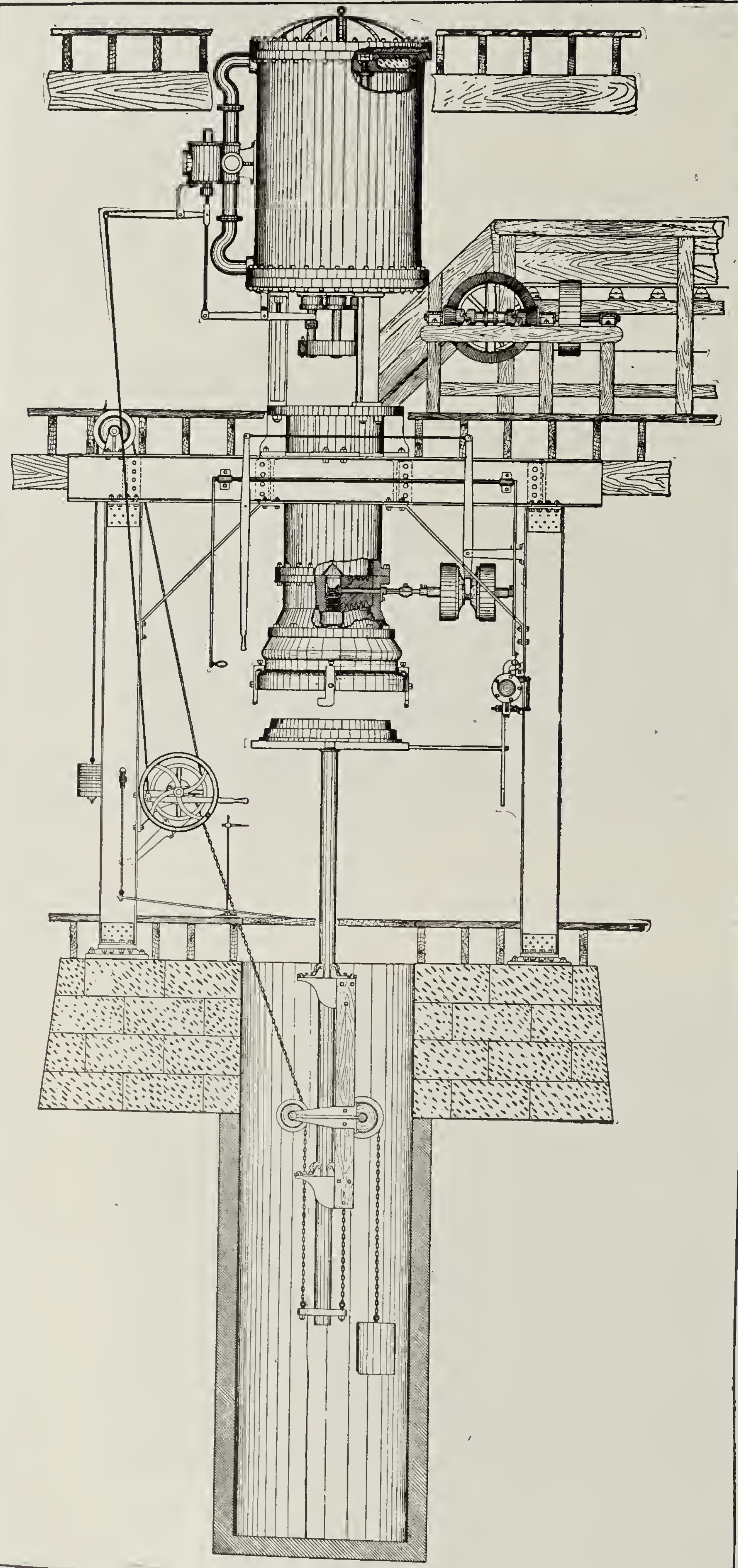

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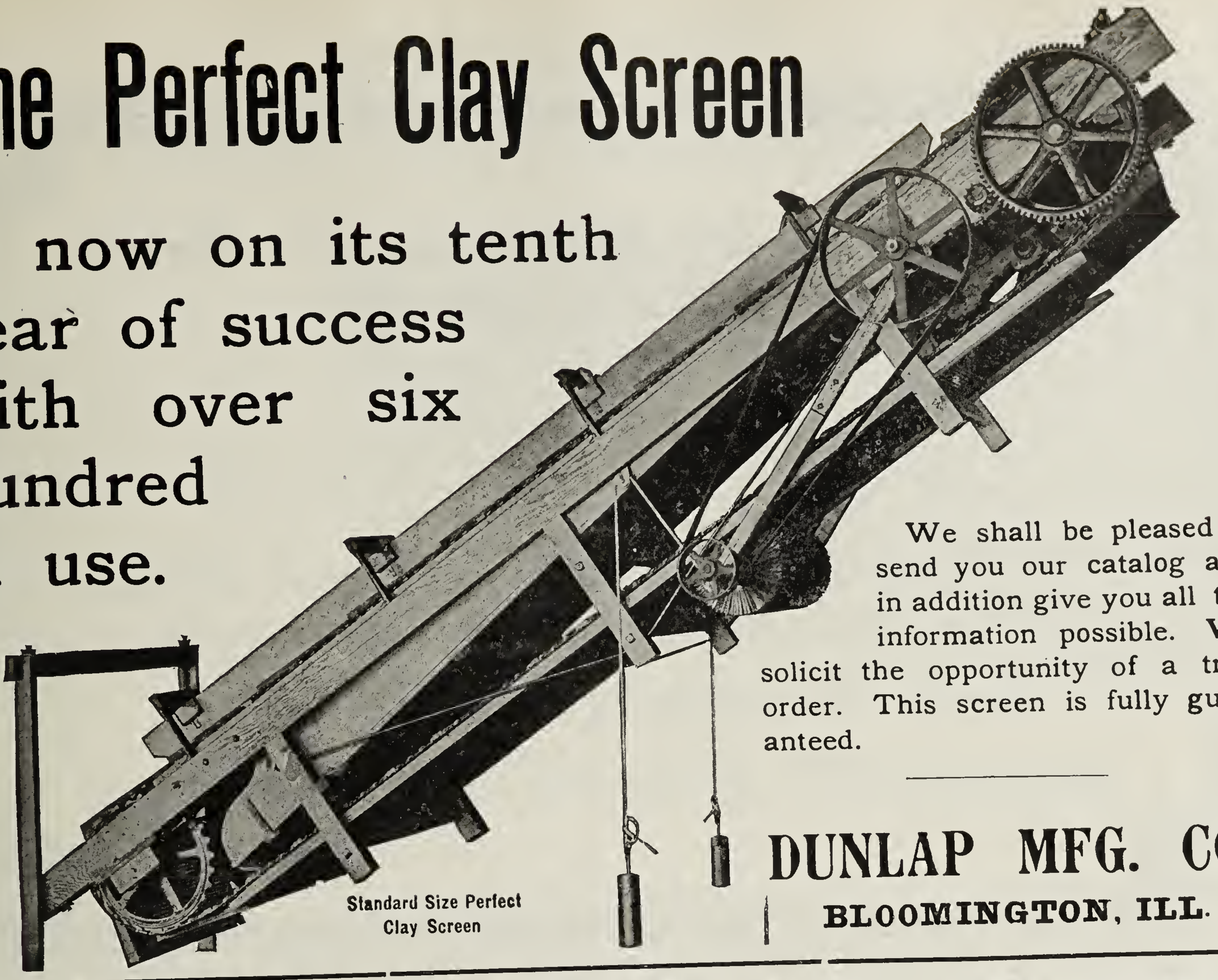

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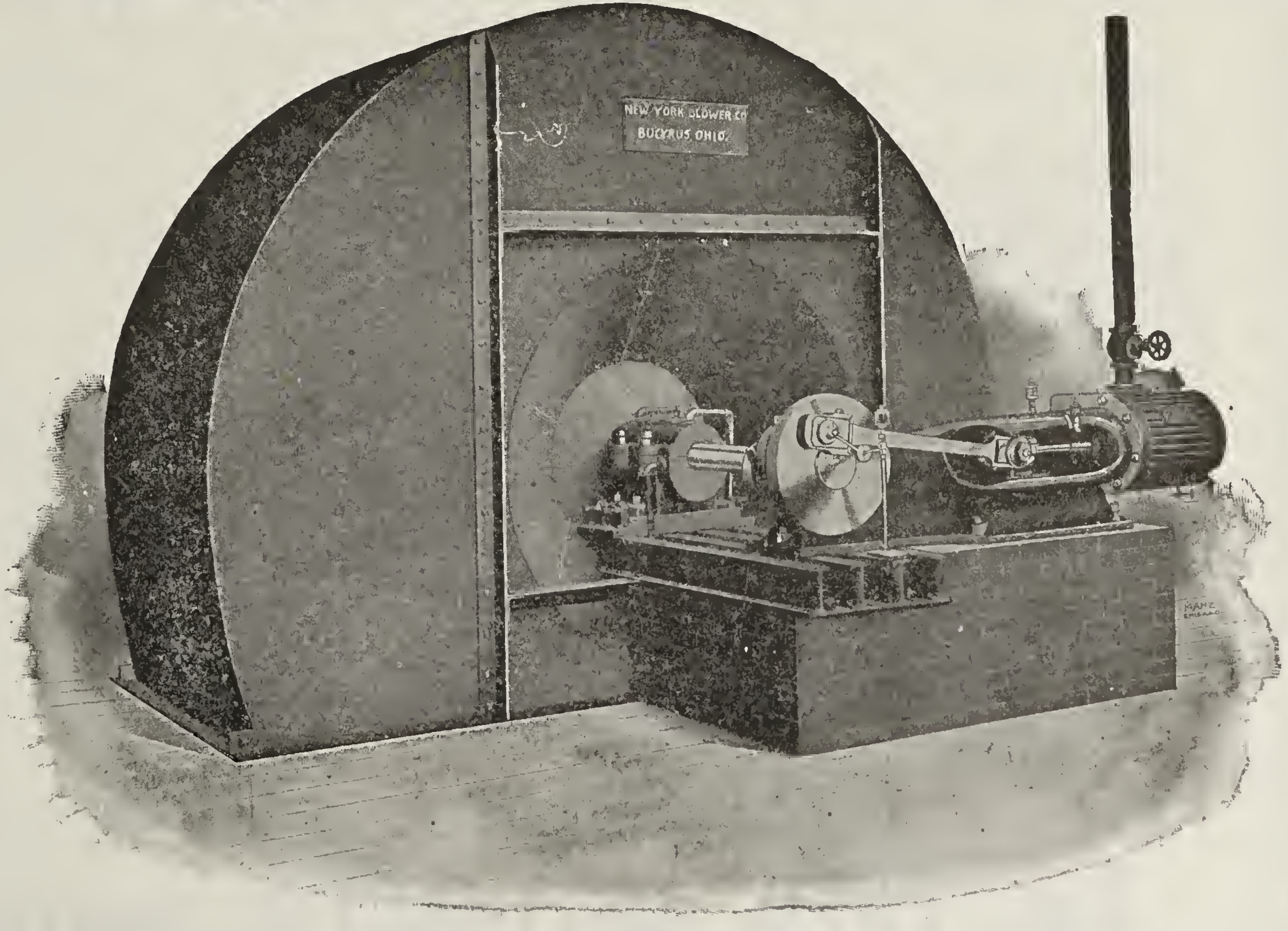

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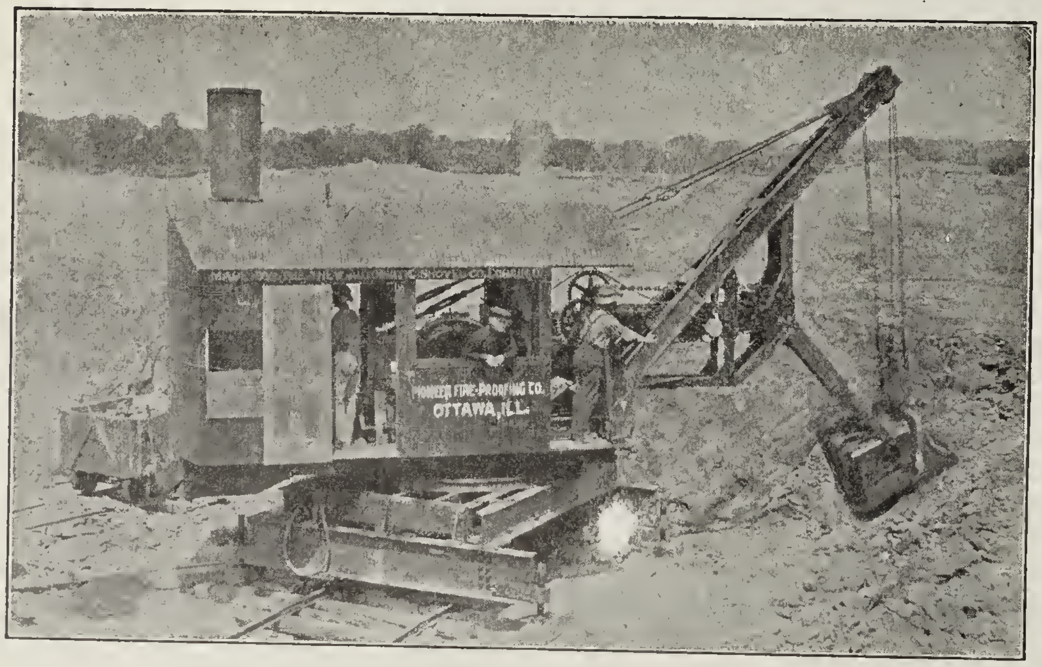

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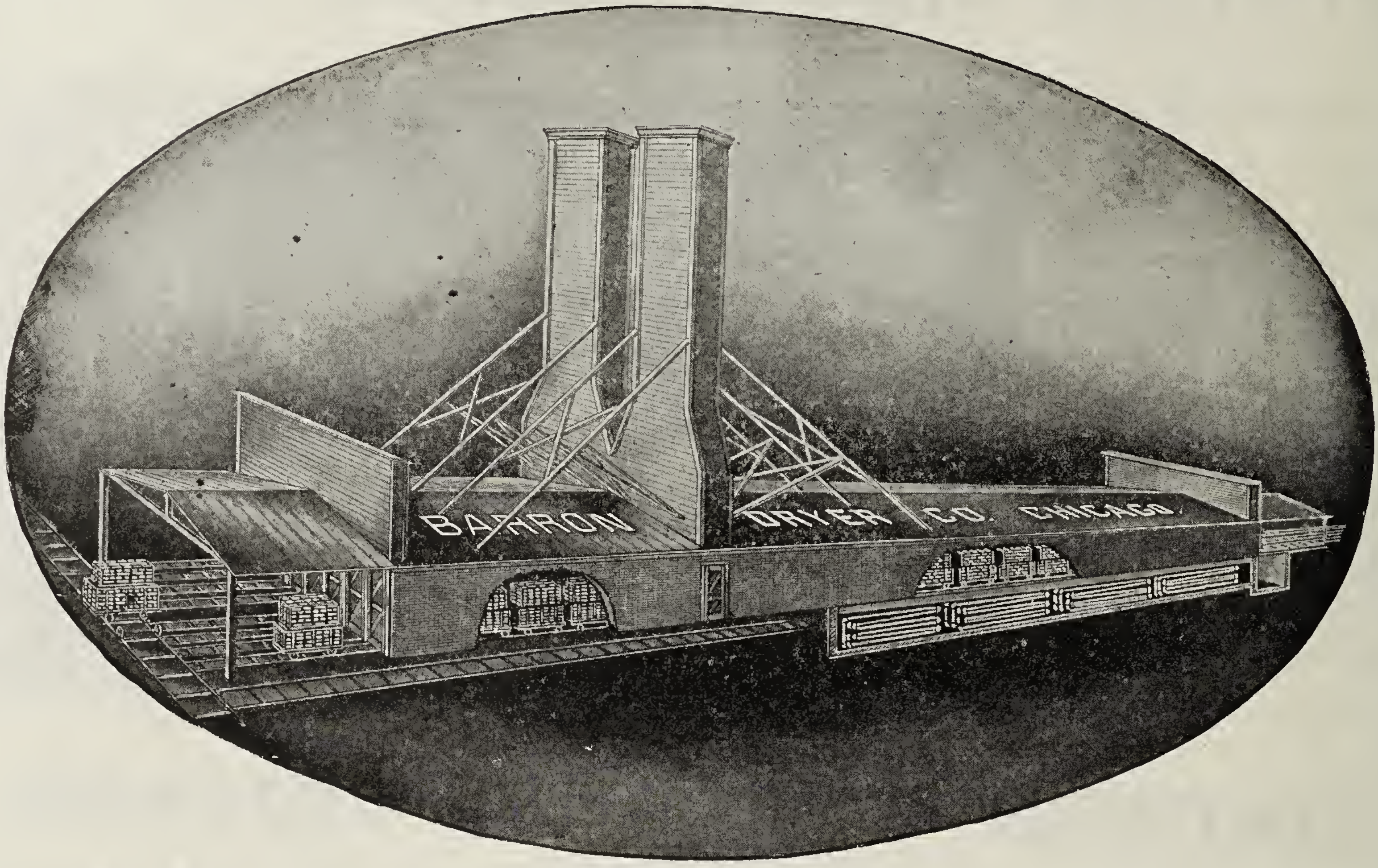
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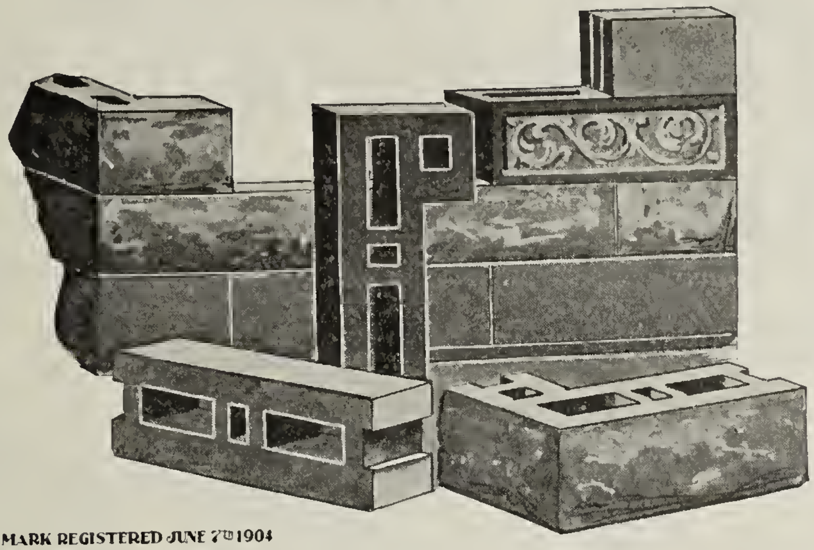

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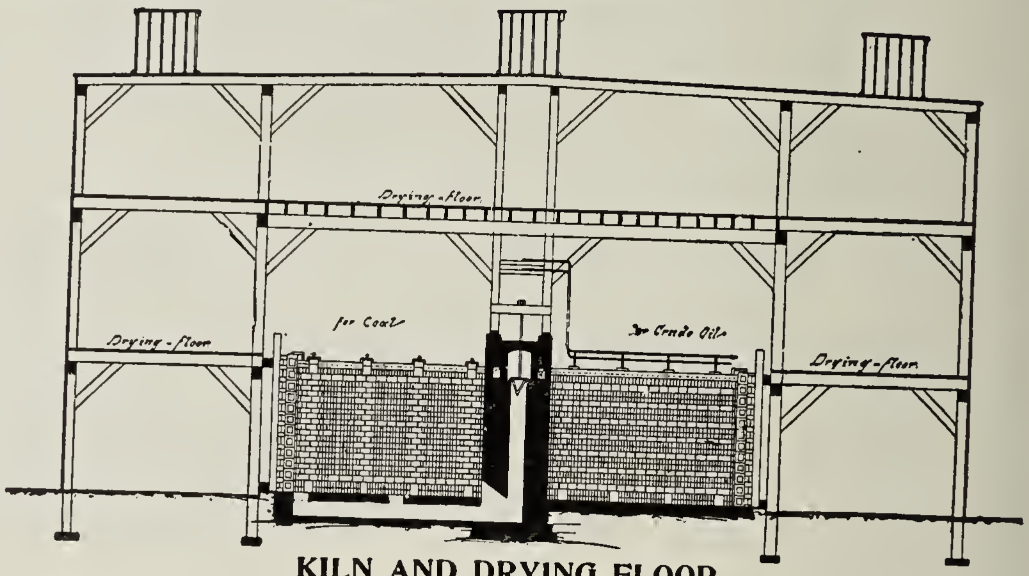

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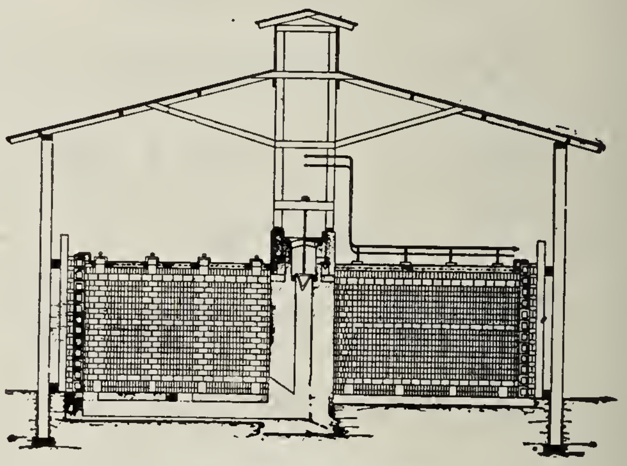

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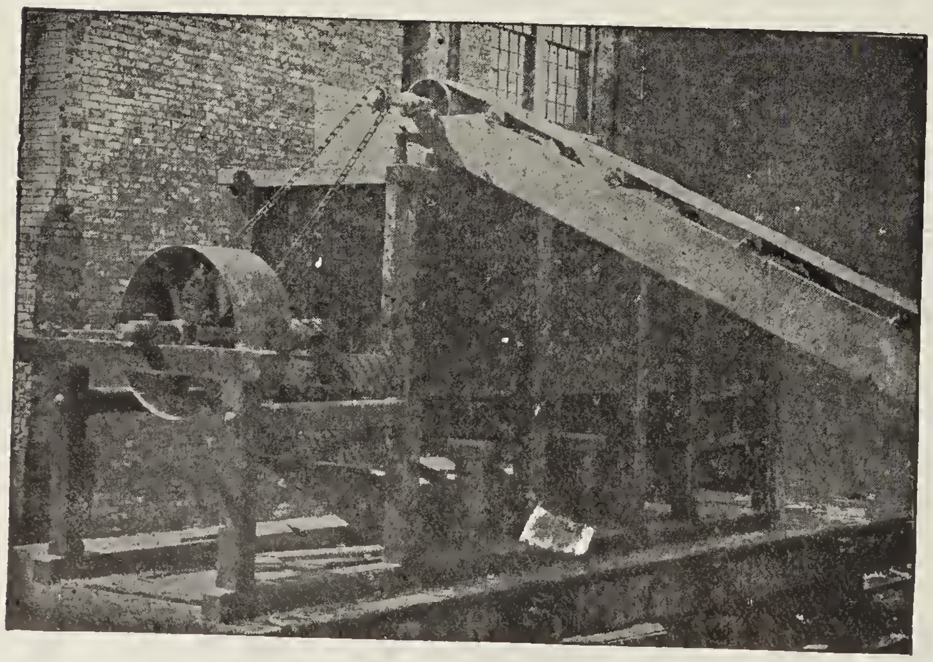

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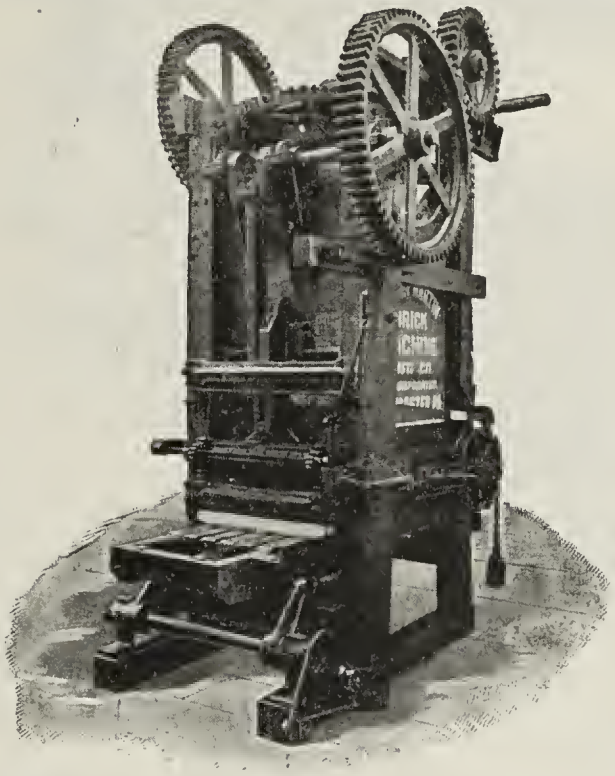

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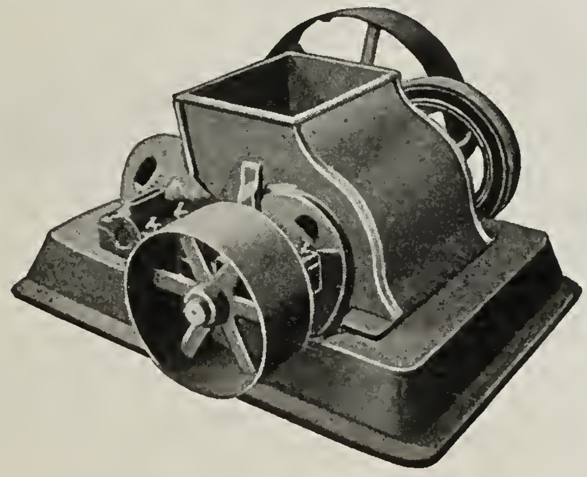

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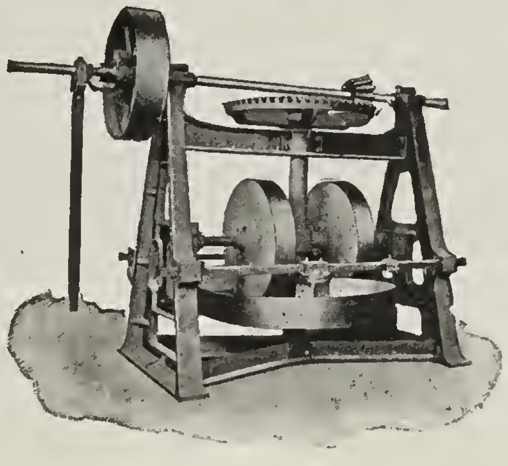

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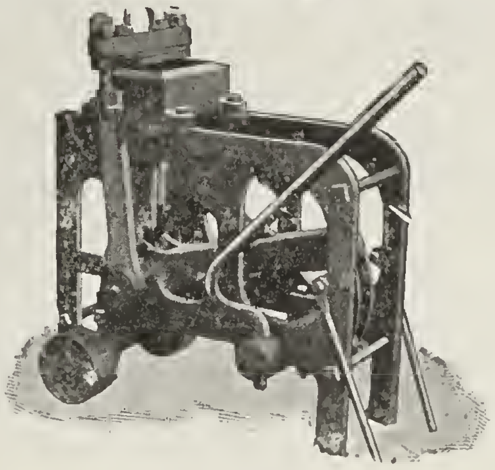

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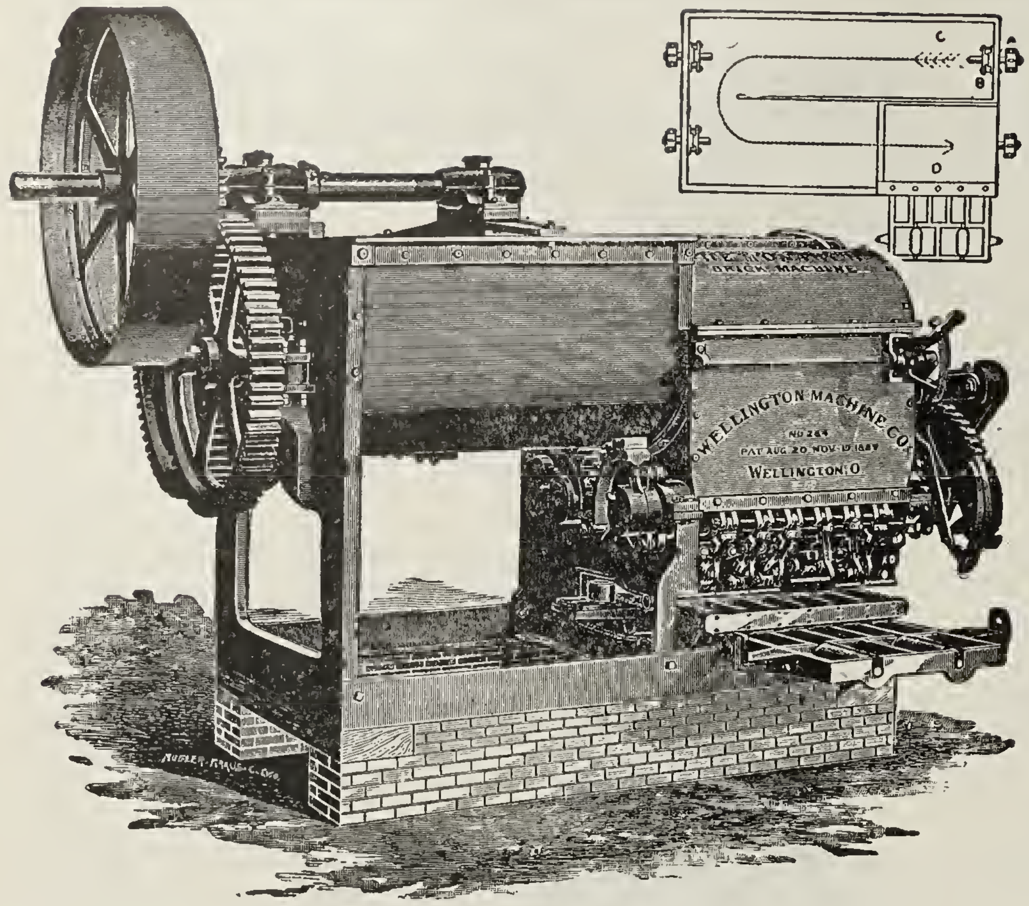

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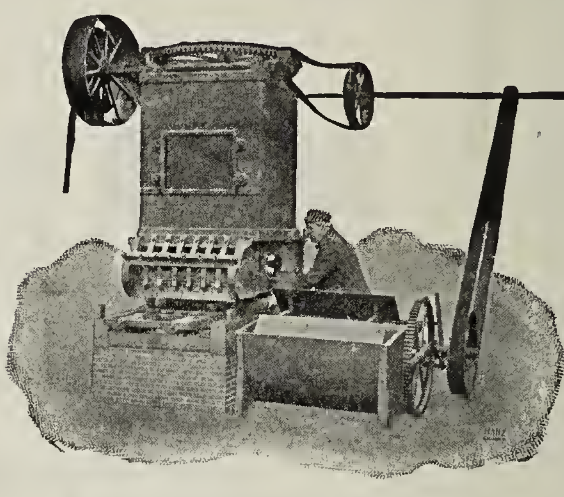

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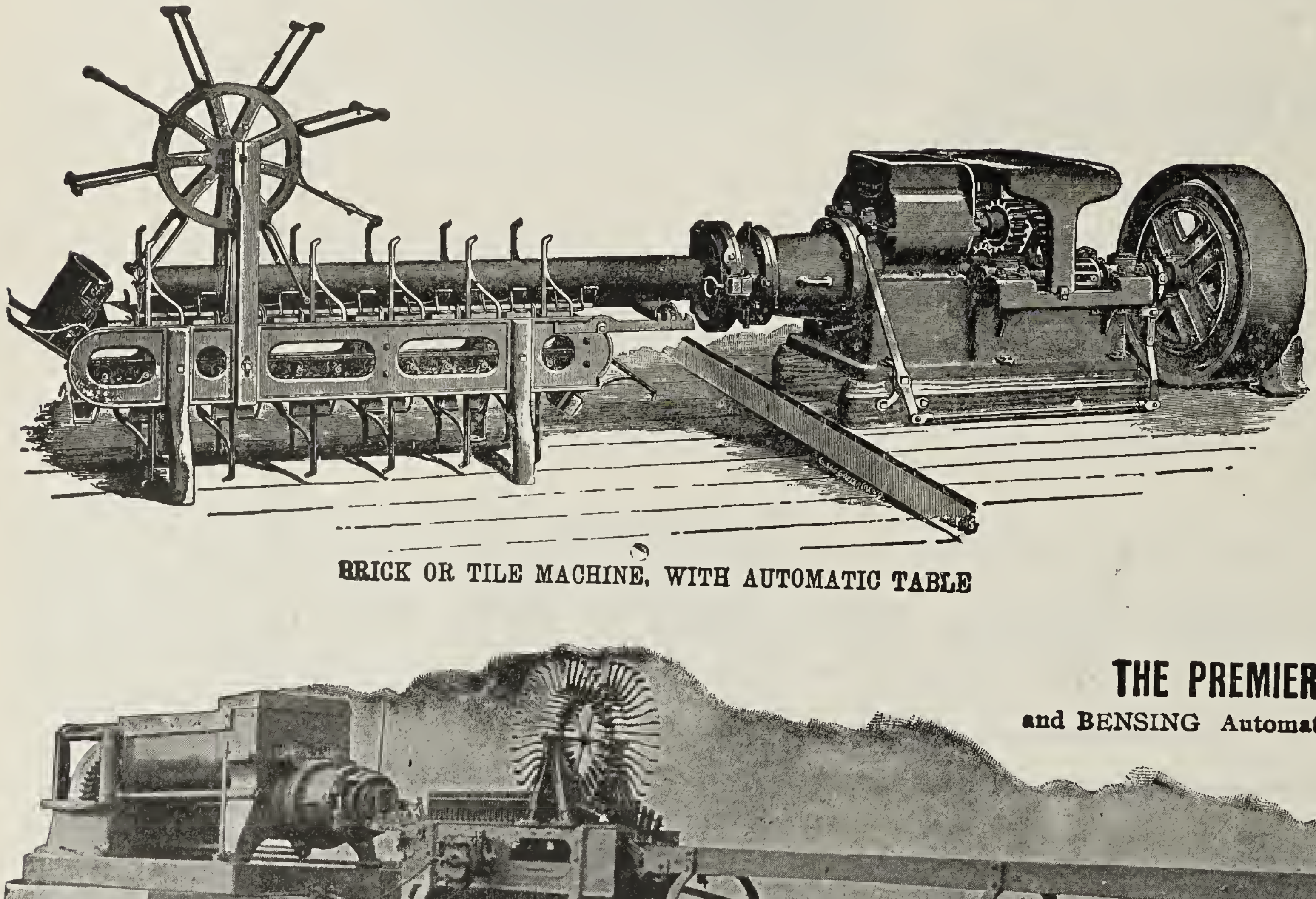

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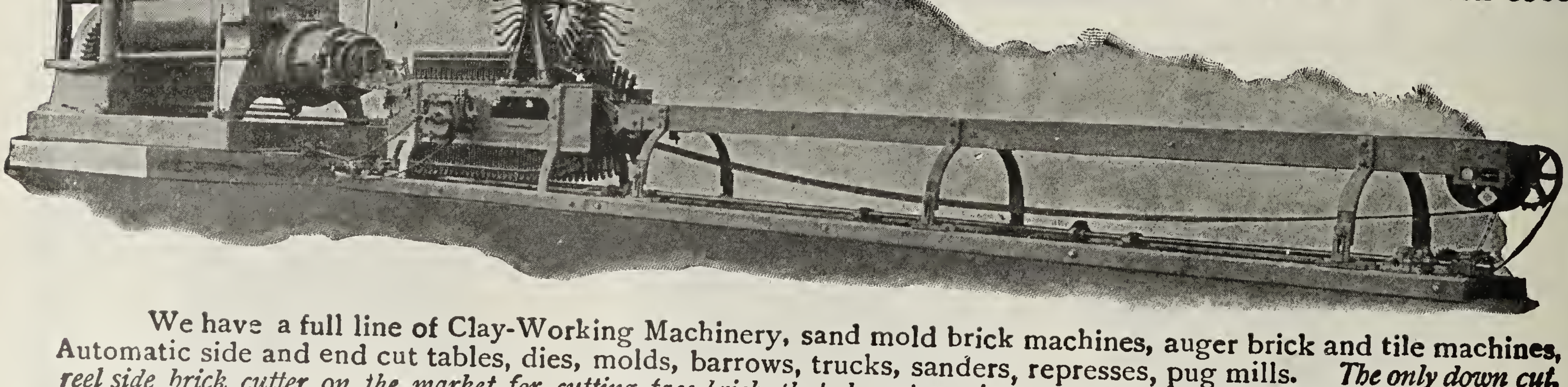

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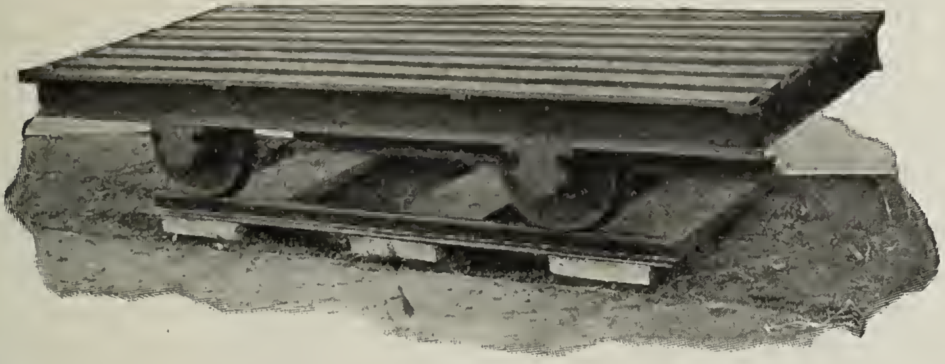

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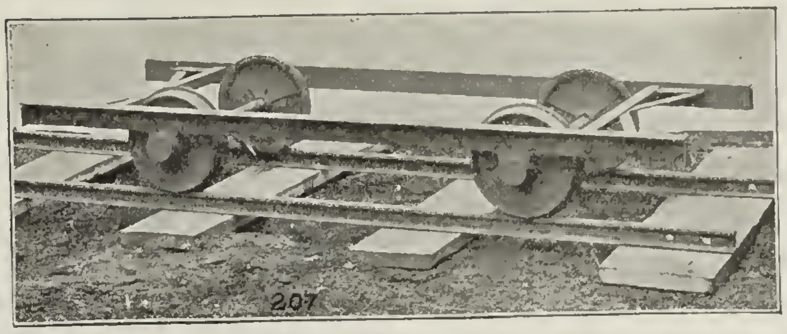

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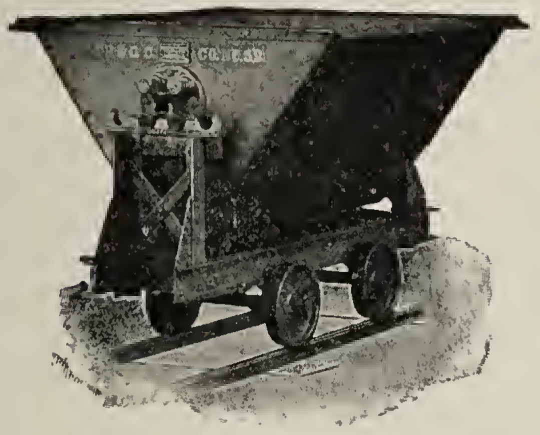

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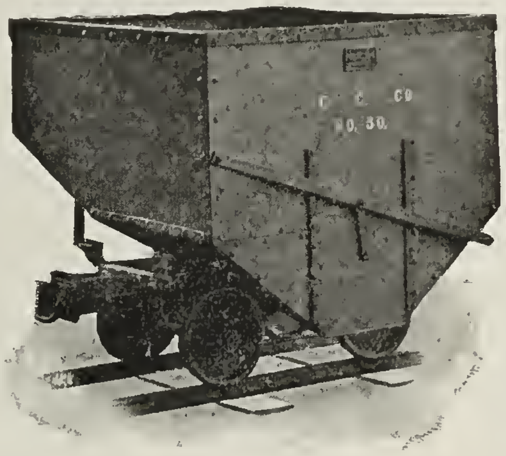

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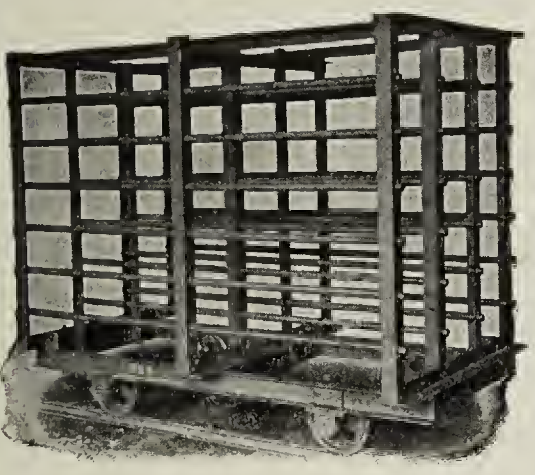

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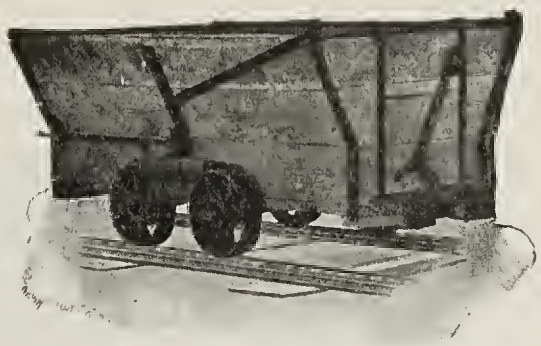

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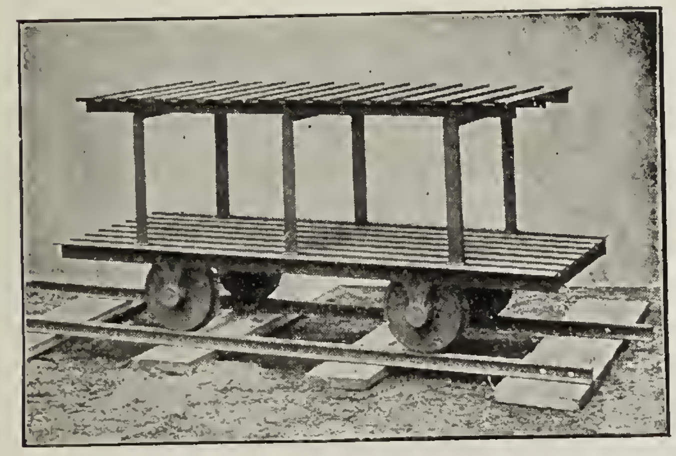

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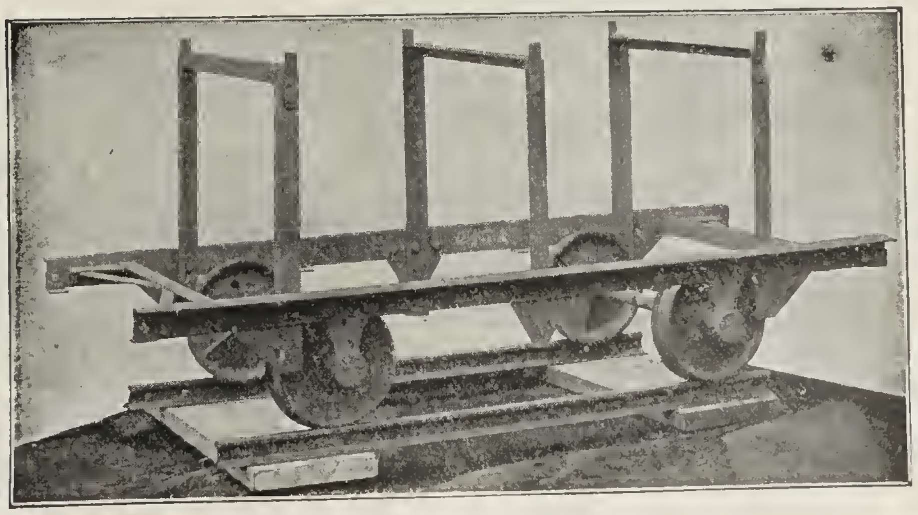

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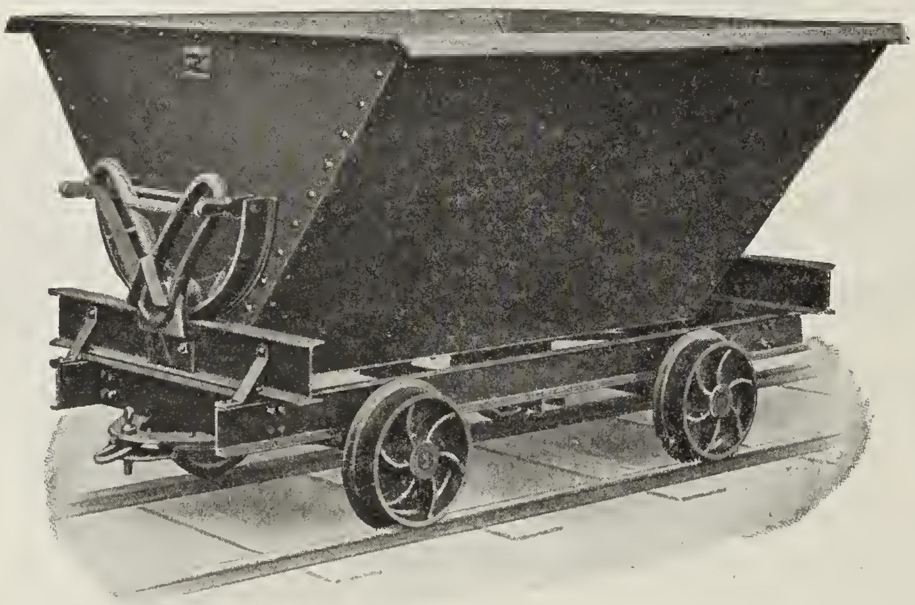

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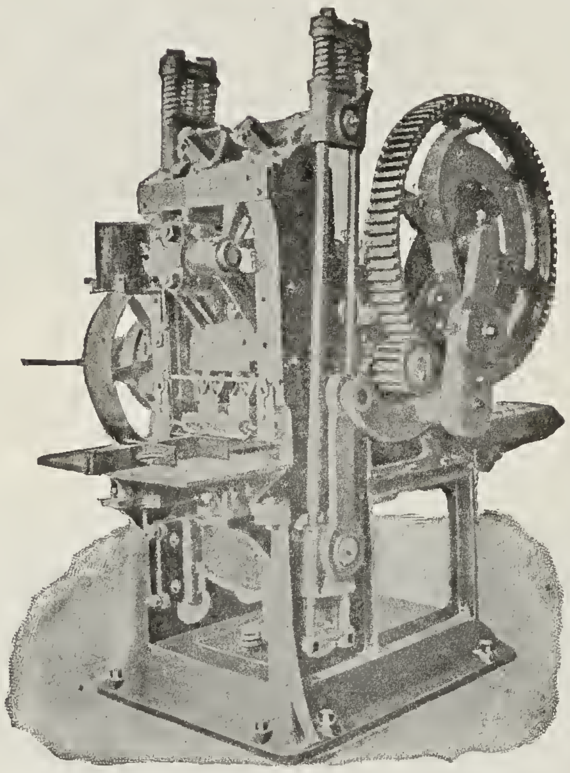

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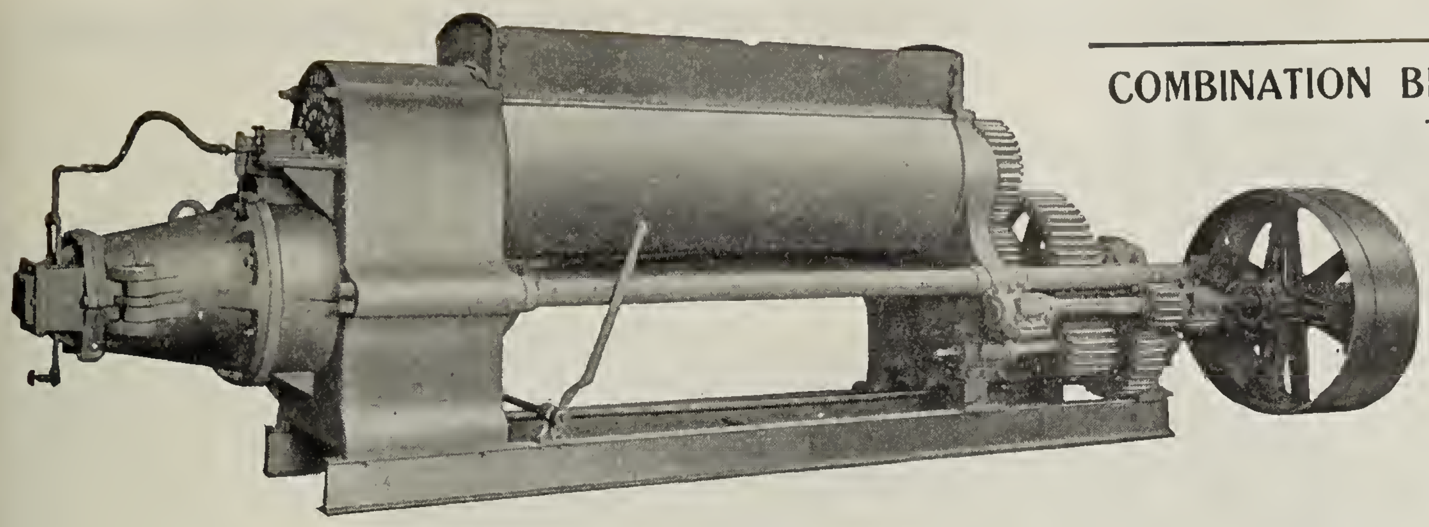

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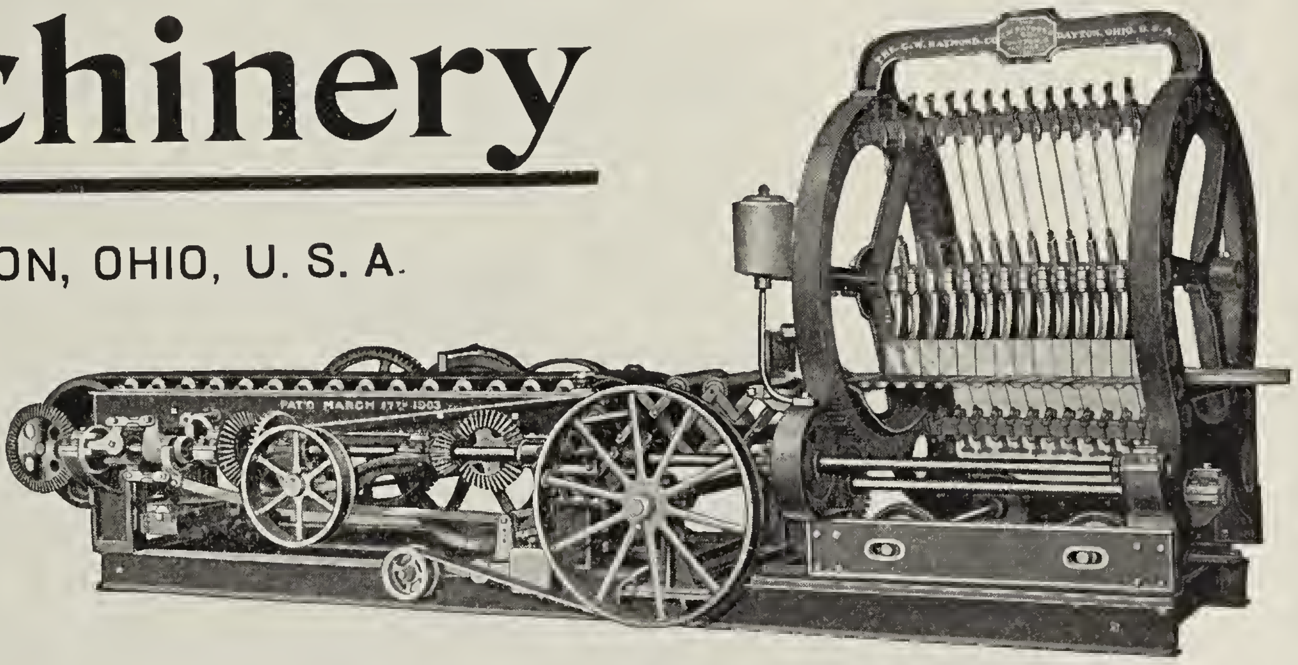
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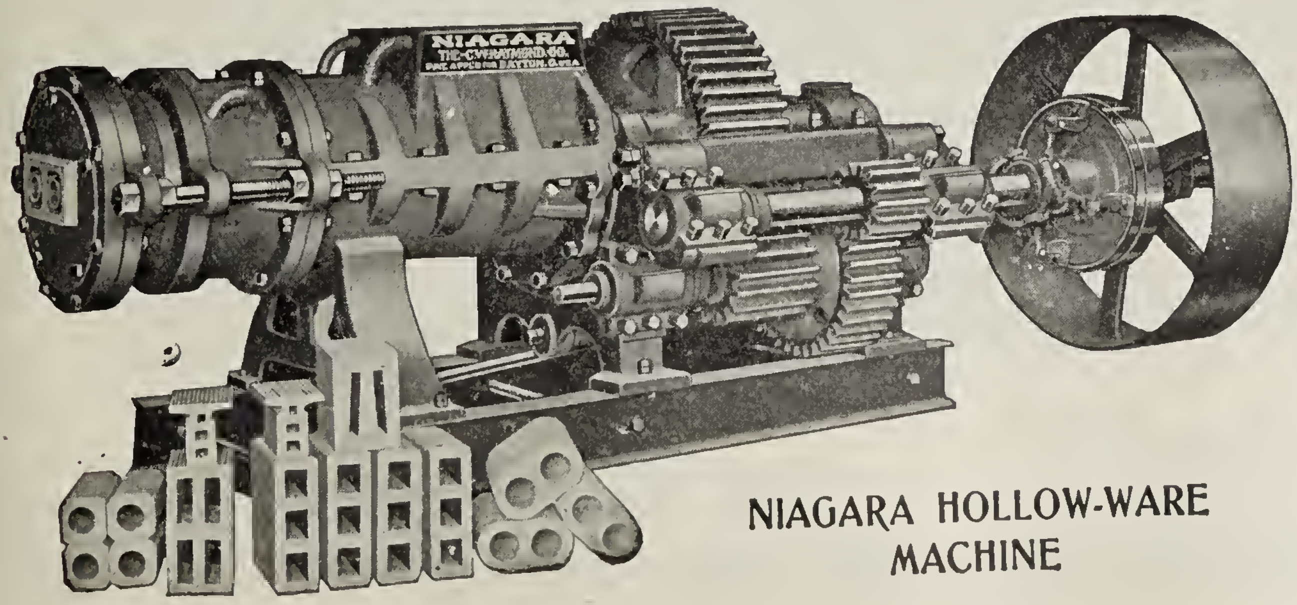
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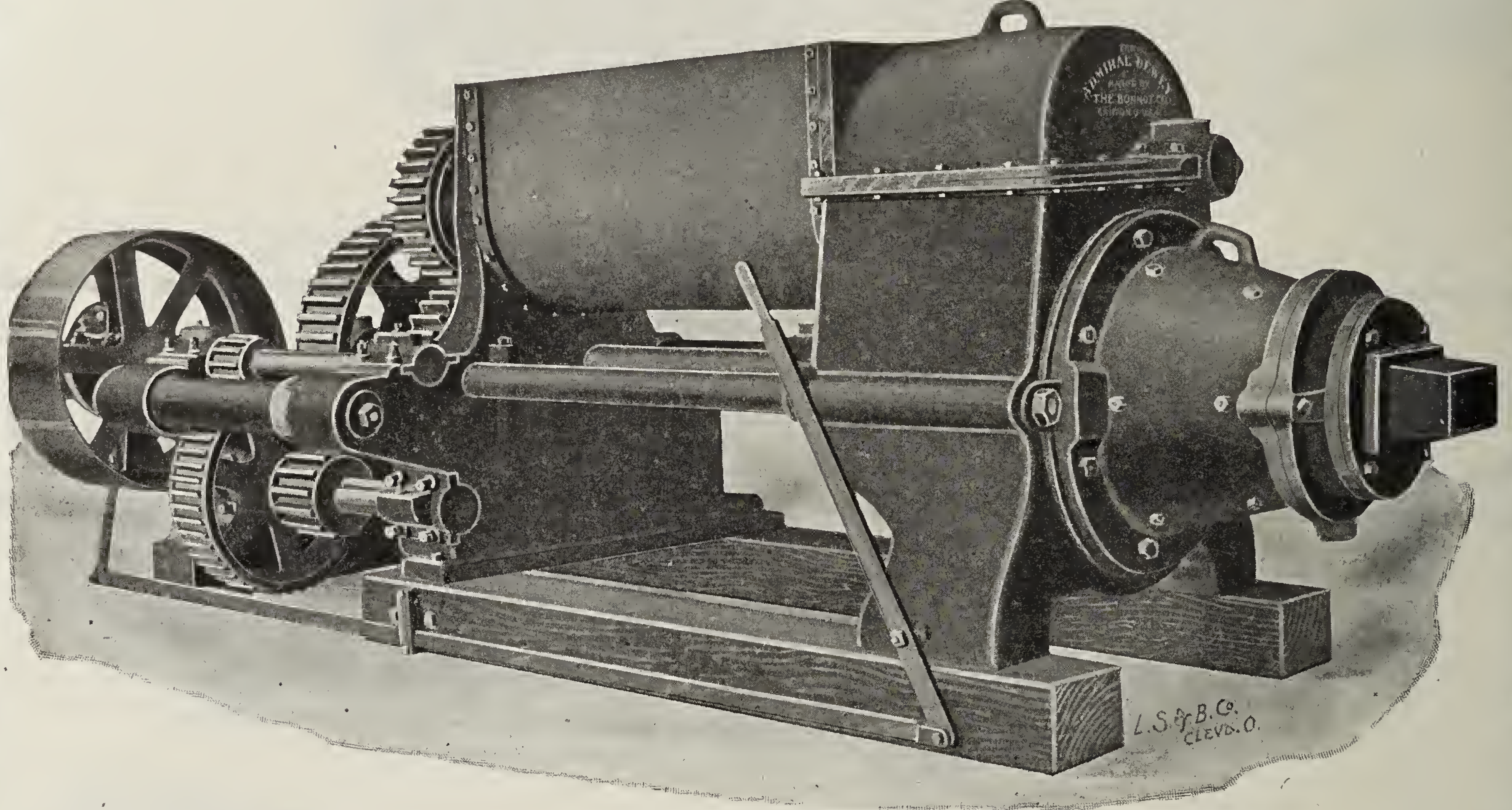
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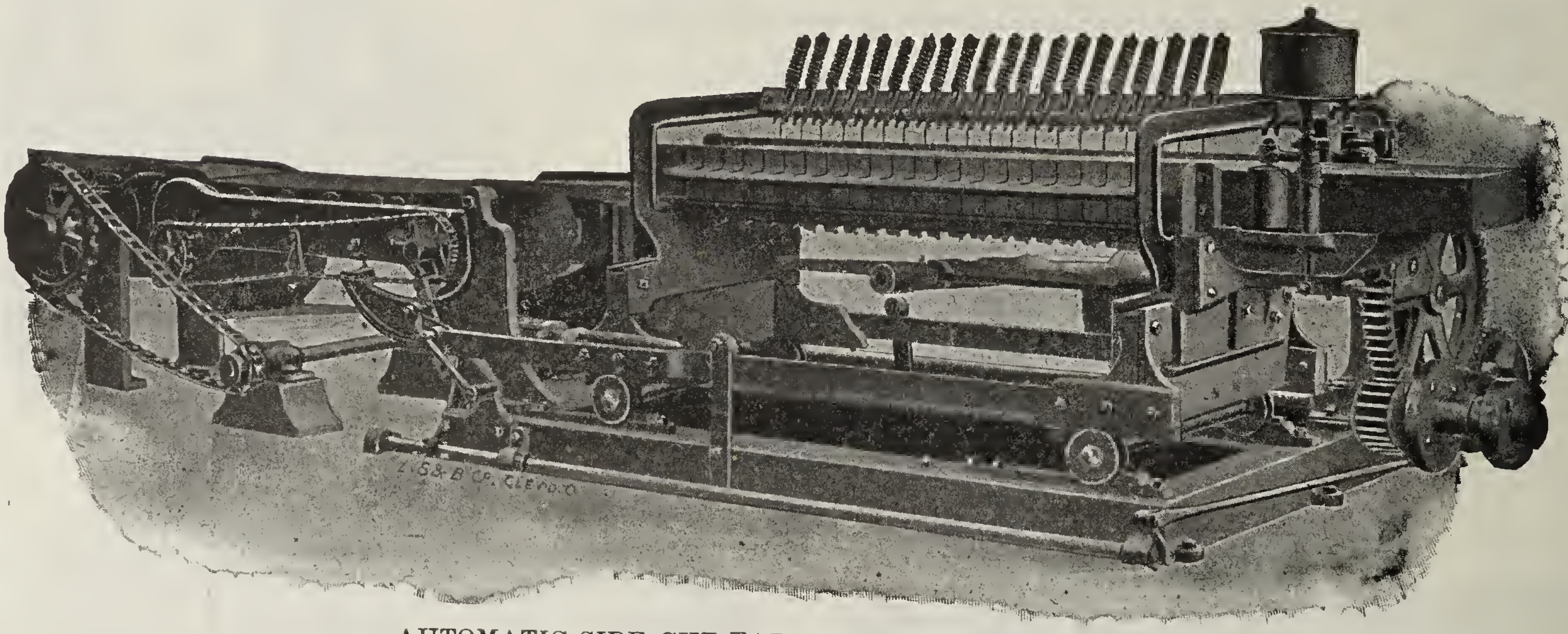
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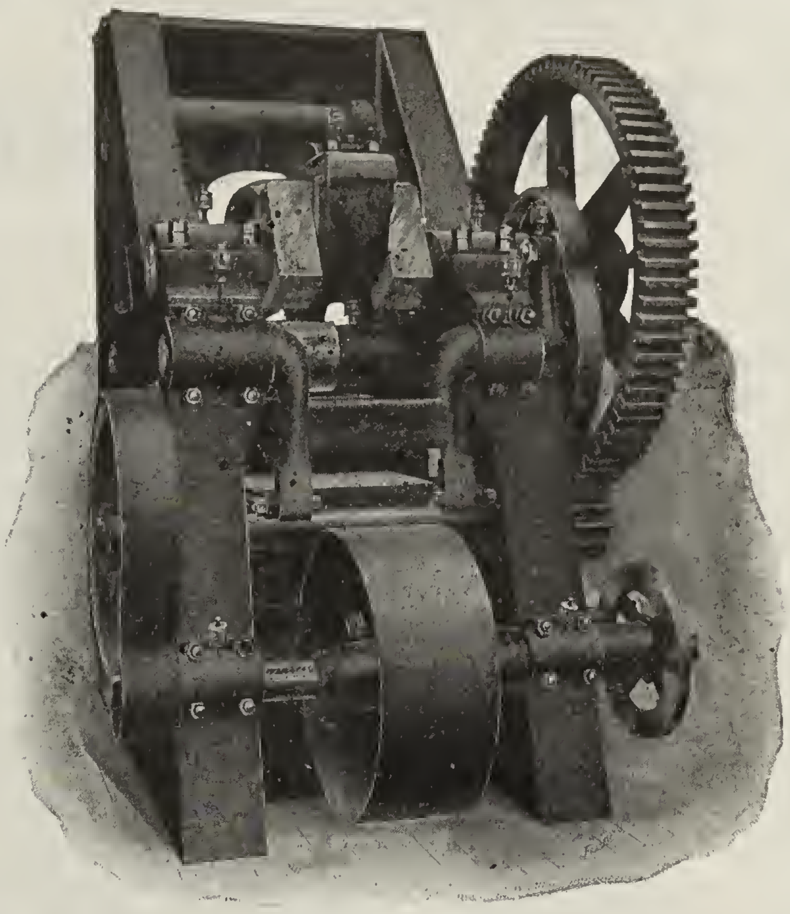

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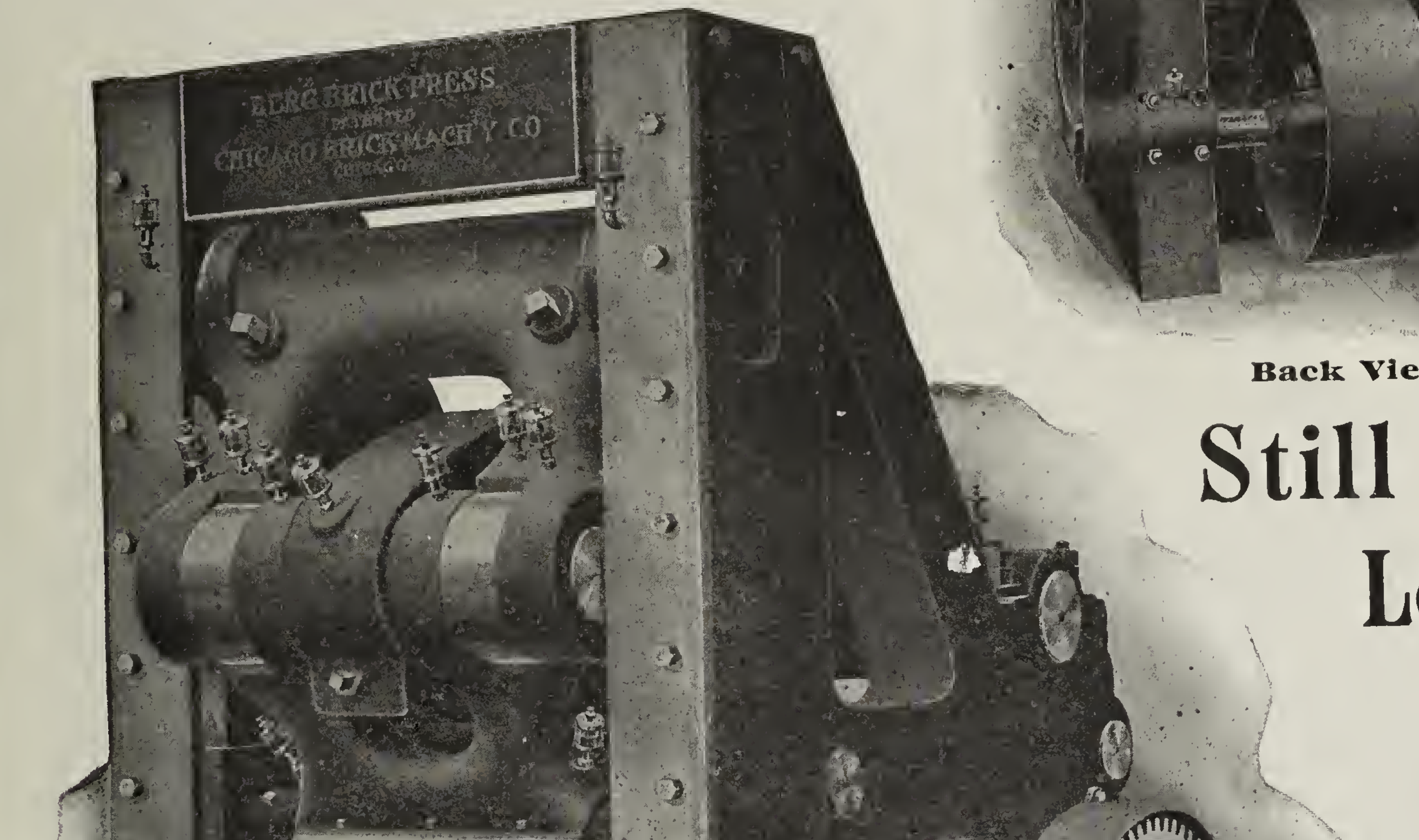

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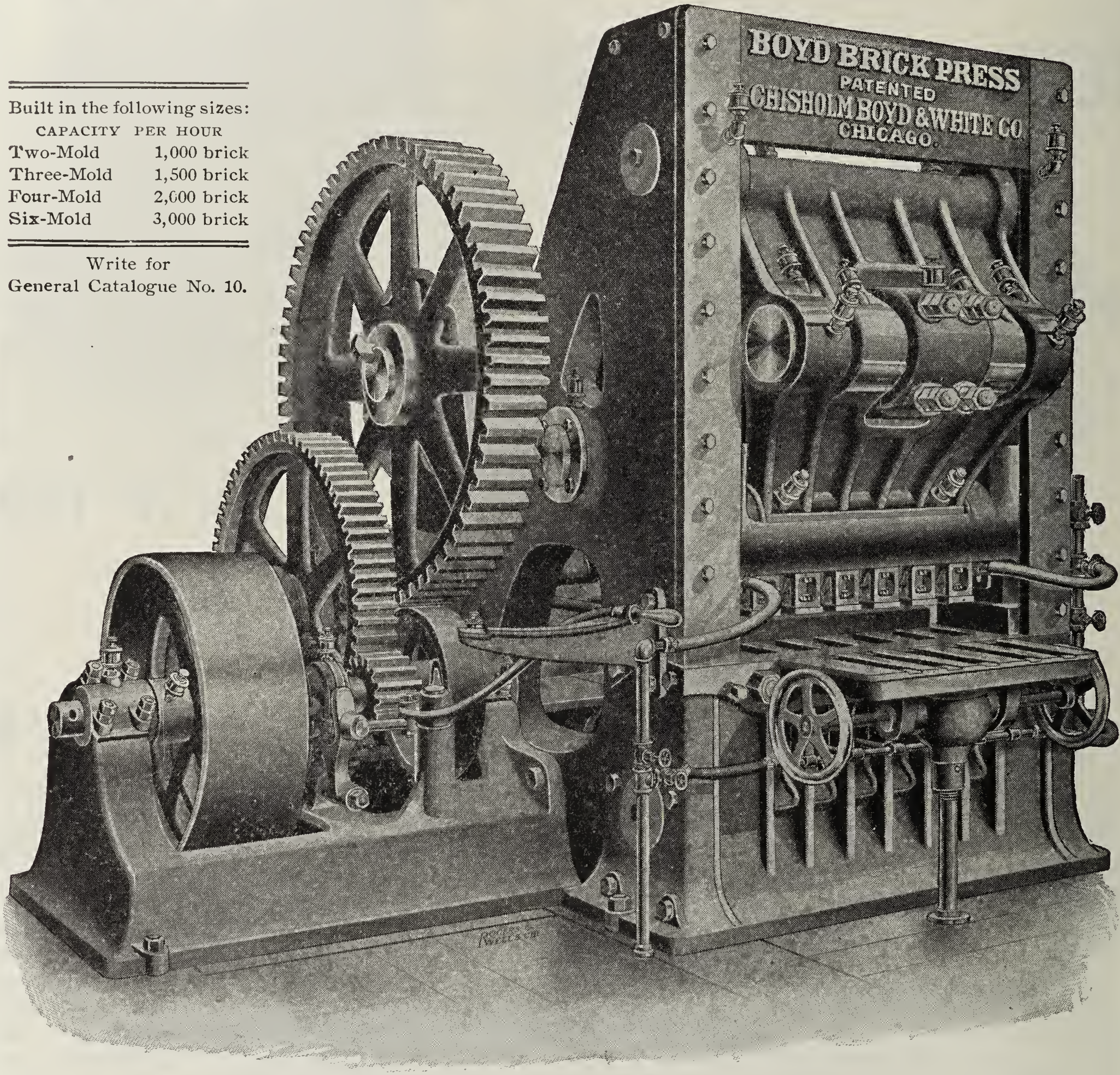

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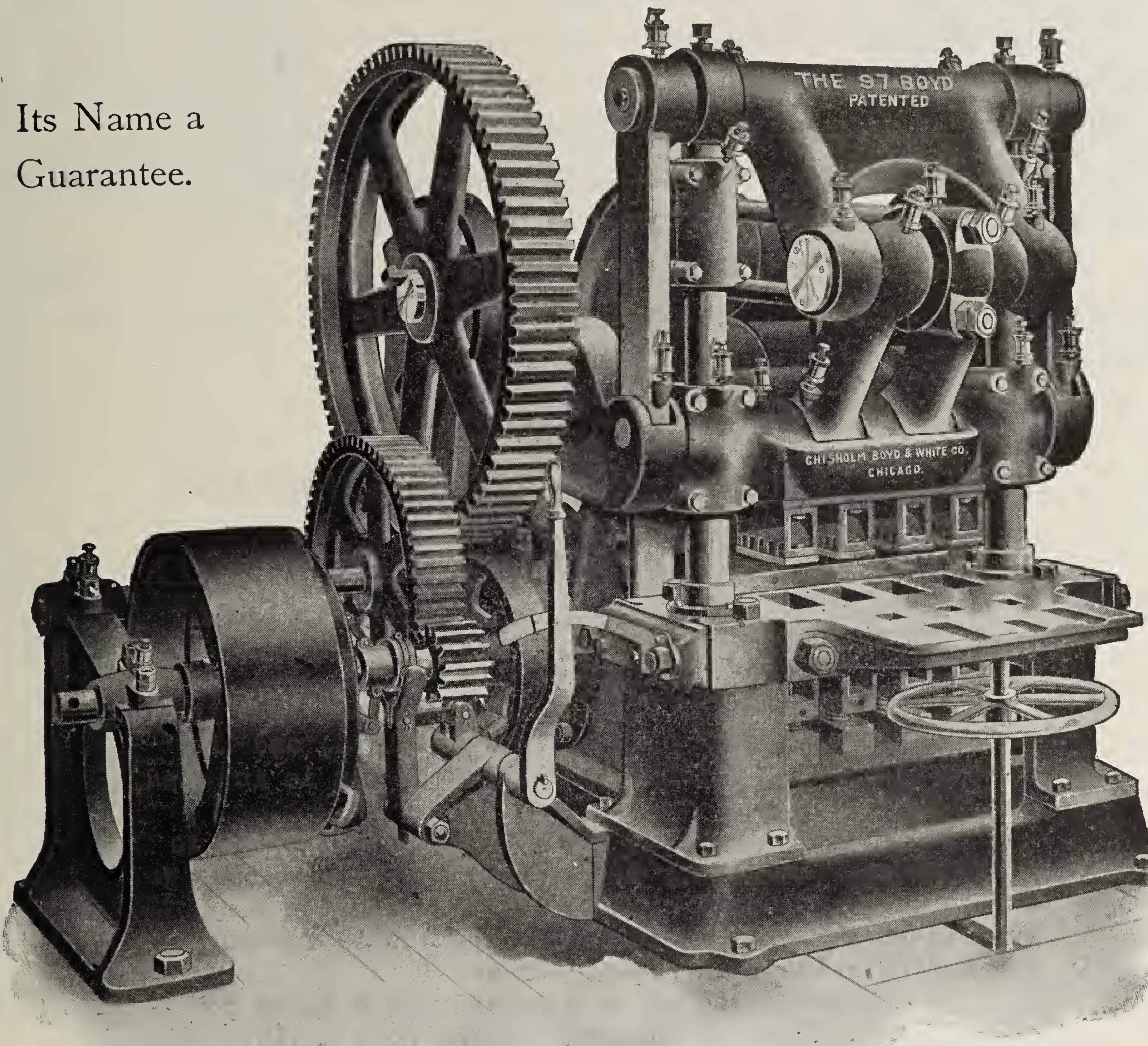

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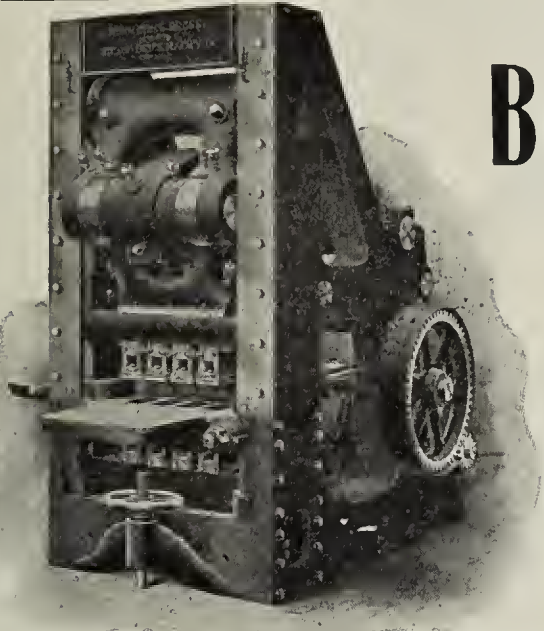

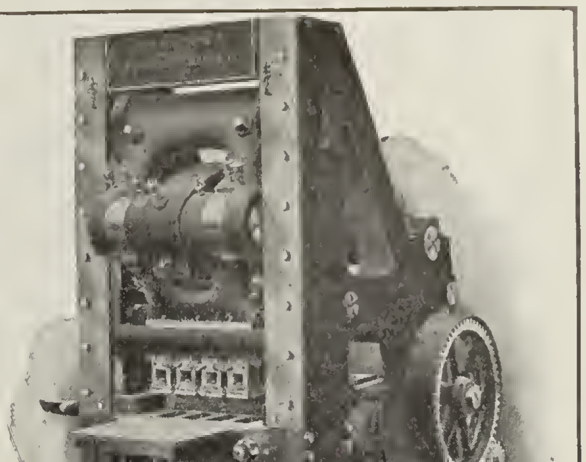

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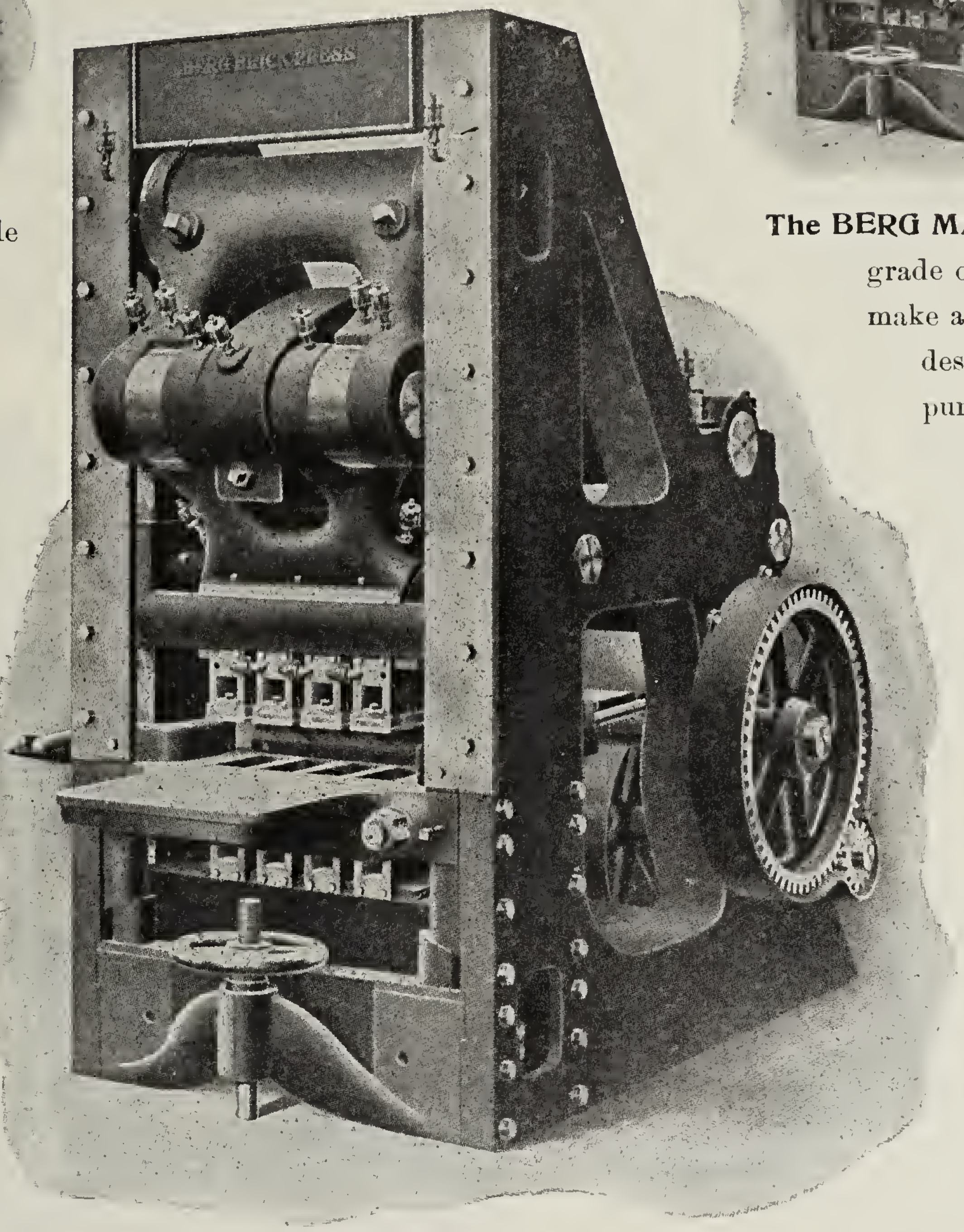
The highest development of the Art of Brickmaking Machinery so pronounced by the United States Government.



The BERG for the highest grade of pressed brick of shale or clay. It makes all kinds of shapes and sizes of brick. Changes from one shape to another can be made in less than an hour's time.

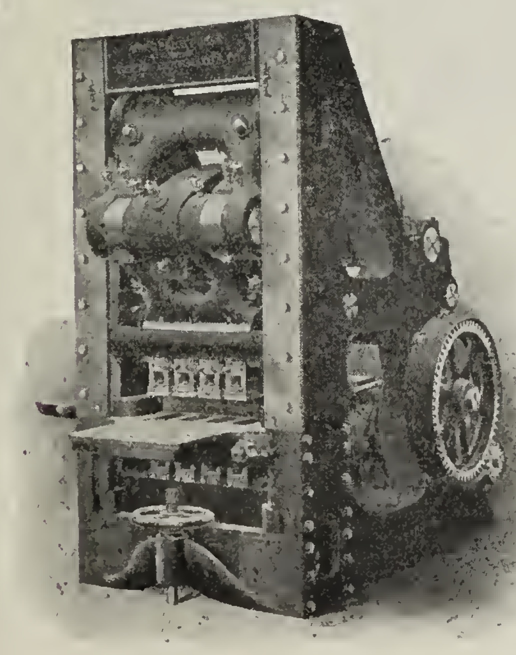
First-Class Workmanship. Cut Gearing. Fully Warranted.

The BERG makes the best sand-lime brick and cheapest because it is the strongest machine and gives the highest pressure. Thirty-five sand-lime plants in United States use the **BERG** Brick Press SUCCESSFULLY.

The BERG MAKES the highest grade of fire brick. Can make all kinds of shapes desired for fire-brick purposes.

Three distinct pressures make the brick evenly pressed all through. No granulated centers of the brick.

The BERG is the best for sand and cement because of its strong pressure. Uses less cement, makes cheaper brick.

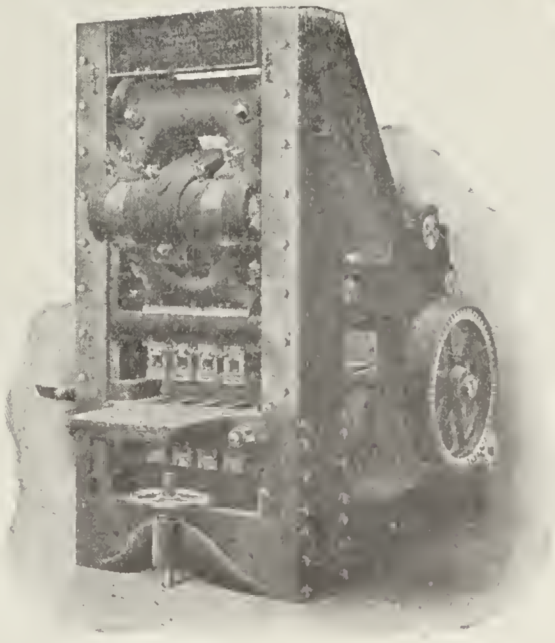


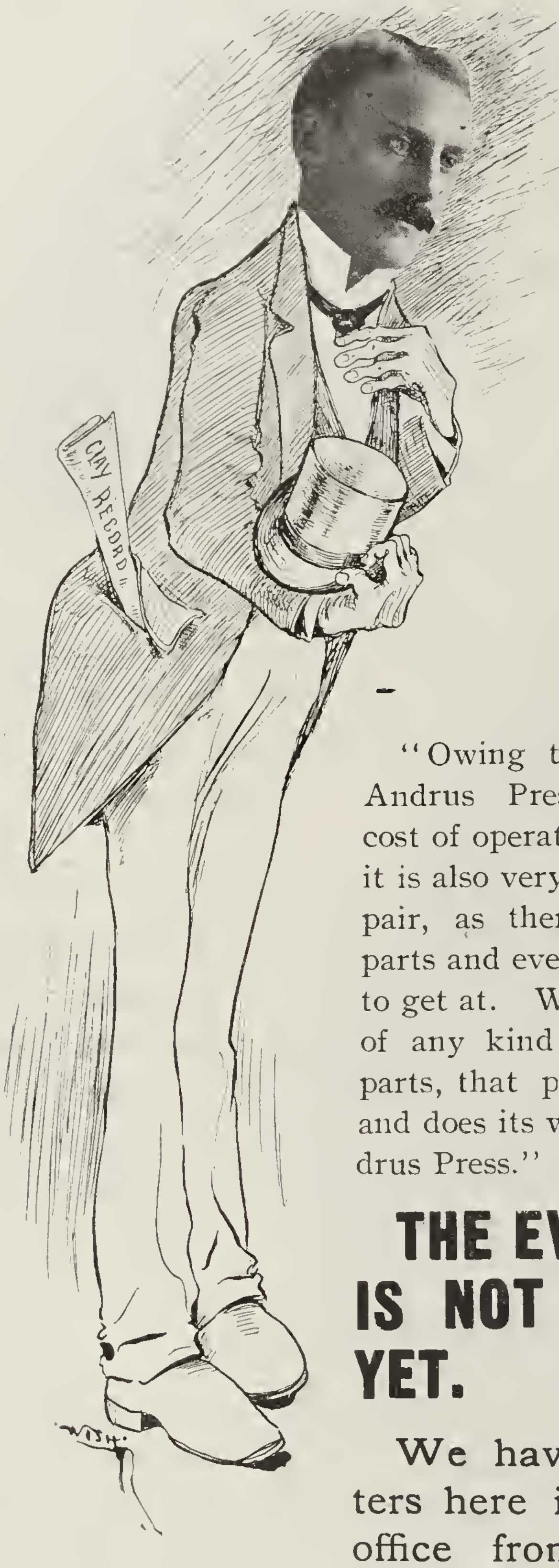
The 1905 Berg Press

Many other steps further forward in improvement and highest grade of material and workmanship, also cut gearing. Fully guaranteed as to its success. Manufactured by its inventor in Toronto, Canada, at the Bertram Engine Works Co. Plans and specifications on the different kinds of plants furnished, also all equipments.

For prices and full particulars, address

A. BERG
THE BERTRAM ENGINE WORKS
Toronto, Ontario, Canada





Even the Editor

Took Off His Hat

When We Cited the Following Instance:

Anthony Ittner Brick Company, with offices in the Odd Fellows Building, here in our city, have seven Andrus Presses on their yard at Bellville, Ill.

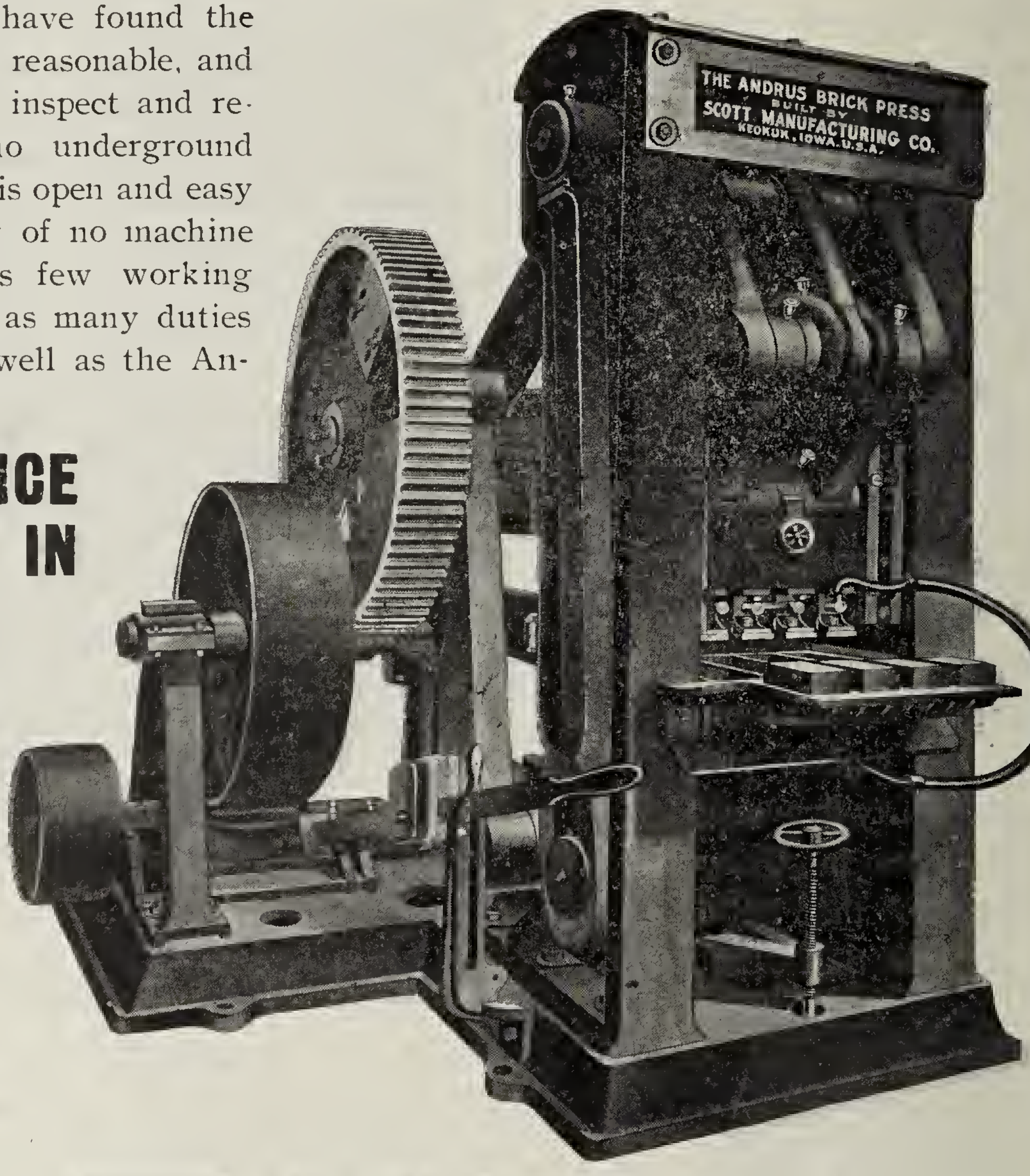
To show what they think of the machine illustrated below, we quote the following from their letter of recommendation:

> "Owing to the simplicity of the Andrus Press, we have found the cost of operation very reasonable, and it is also very easy to inspect and repair, as there are no underground parts and everything is open and easy to get at. We know of no machine of any kind with as few working parts, that performs as many duties and does its work as well as the Andrus Press."

THE EVIDENCE IS NOT ALL IN YET.

We have letters here in our office from almost every state in the Union, all of which corroborate the above statements.

In addition to letters of recommendation, we have eighteen Andrus Presses in the St. Louis district "making brick every day."



THIS IS THE PRESS THAT SCOTT BUILDS.

SCOTT MANUFACTURING COMPANY

WORKS:
Keokuk, Iowa.

Commonwealth Trust Building

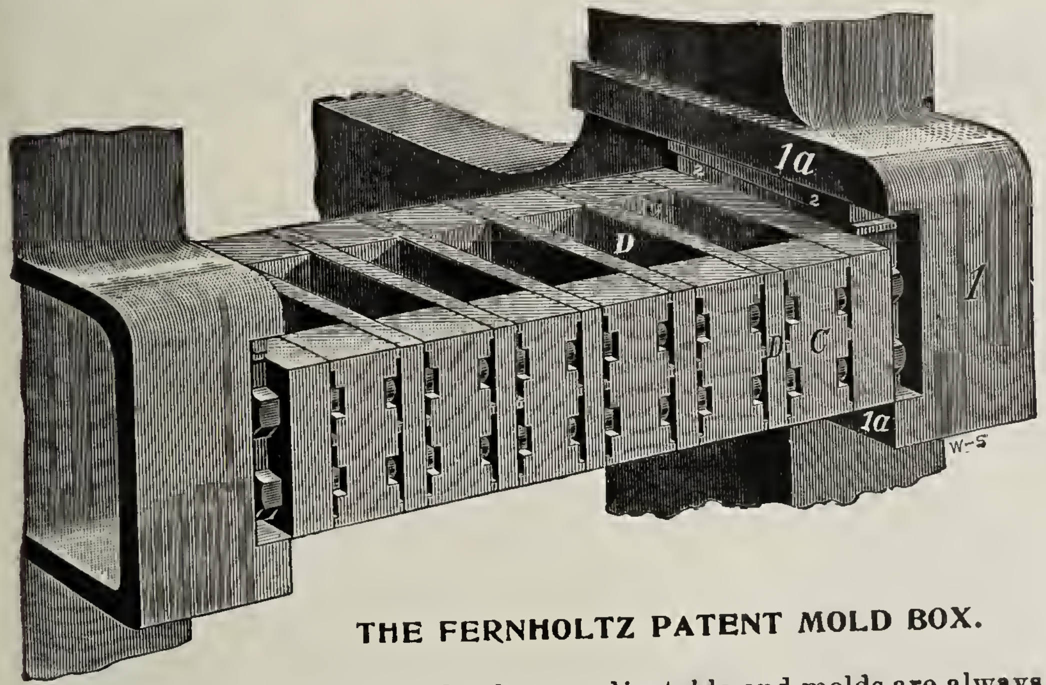
ST. LOUIS, MO.

THE FERNHOLTZ BRICK MACHINERY CO.

Manufacturers of

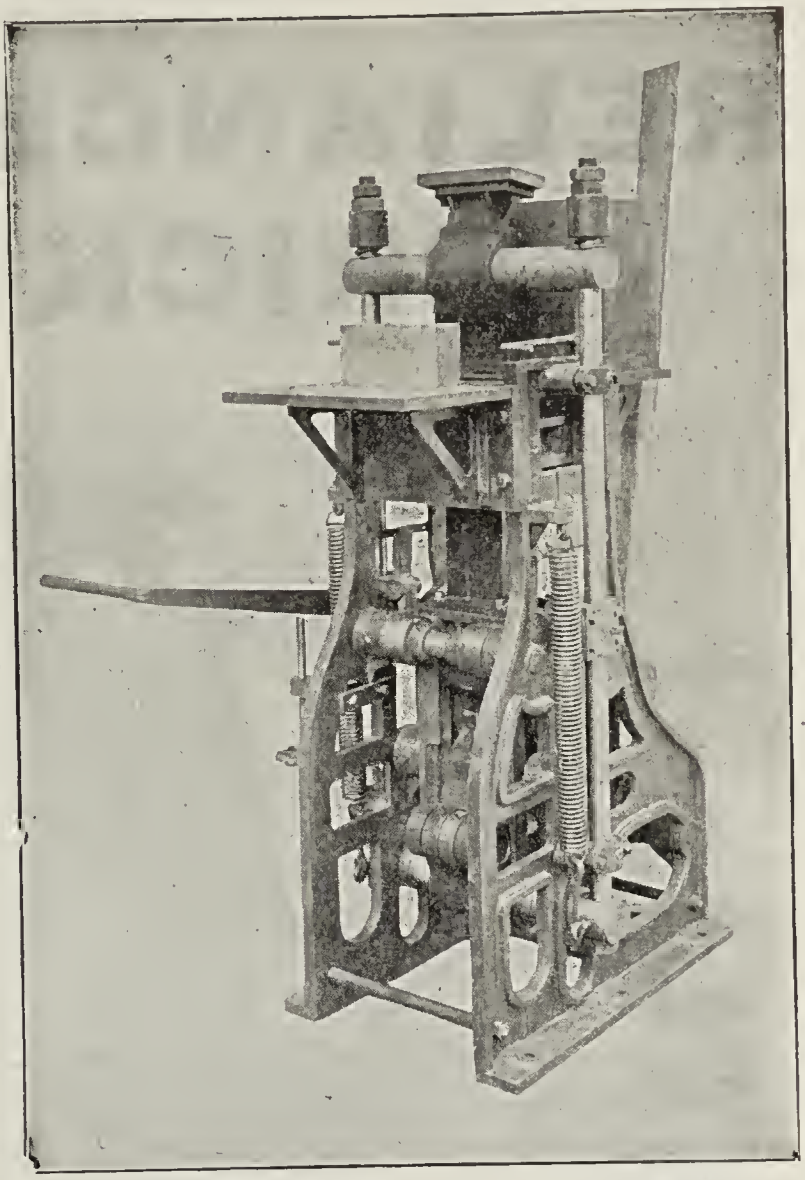
The Celebrated Fernholtz Dry Press

Four mold Press 20,000 daily capacity. Six mold Press 30,000 daily capacity



THE FERNHOLTZ PATENT MOLD BOX.

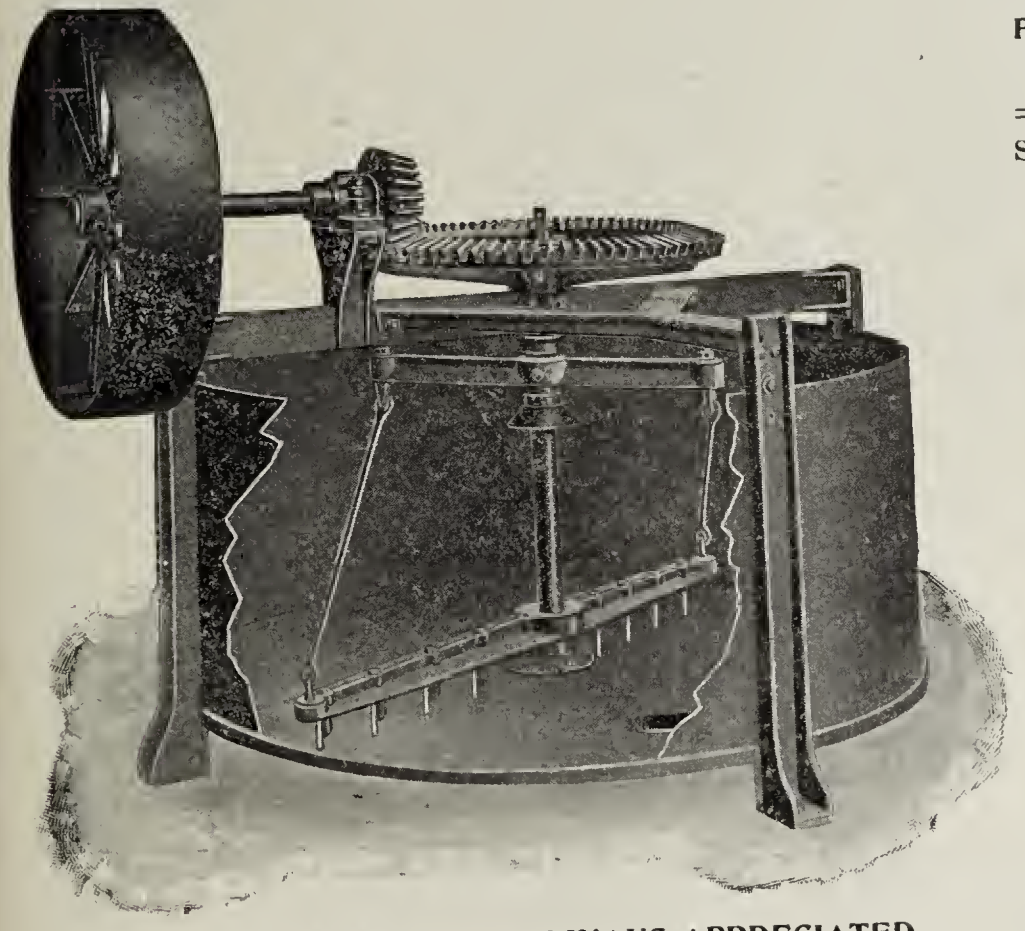
No old style Liners The Blocks are adjustable and molds are always one size. We have put them in most all makes of Dry Press machines. Easily and quickly adjusted. They are made entirely out of chilled iron, the hardest known metal.



GRATH PATENT HAND POWER PRESS.

GRATH PATENT HAND POWER PRESS.

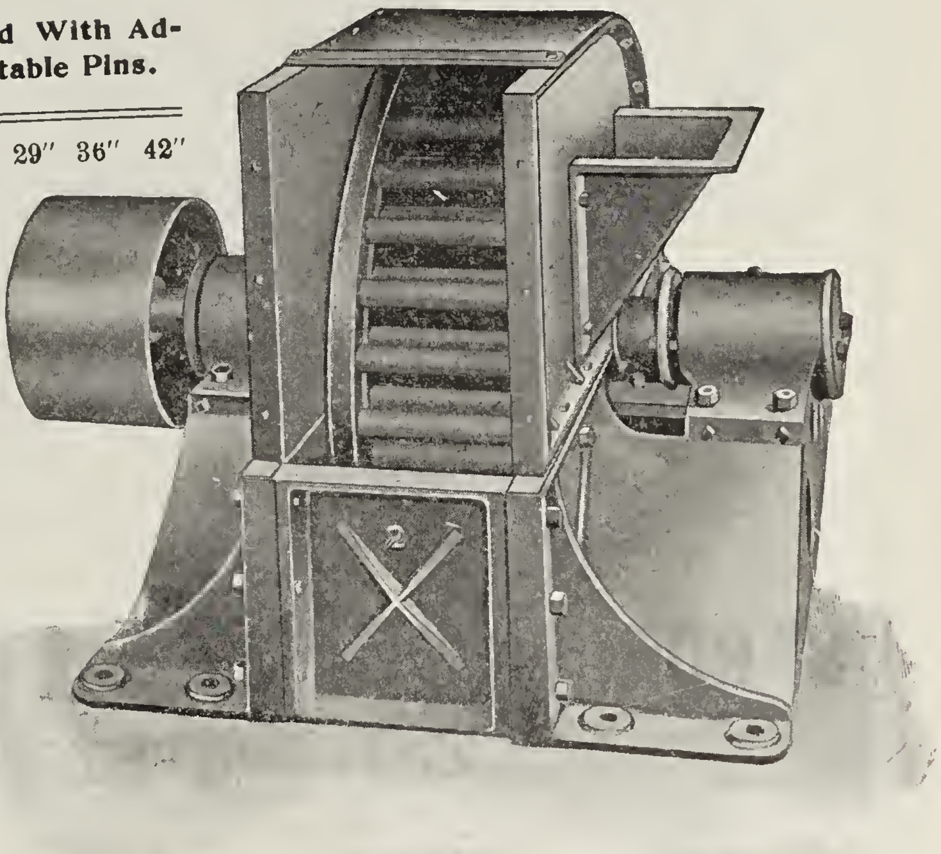
Especially adapted for ornamental designs Any size brick up to 12⅝ inches long, 10 inches wide and 4¼ inches thick.
Brick set into kiln direct from press.



A GOOD MIXER IS ALWAYS APPRECIATED.

Fitted With Adjustable Pins.

Sizes 29" 36" 42"



THE FERNHOLTZ CLAY PULVERIZER.

The Fernholtz Brick Machinery Co.

Cable Address "Fernbrick." Western Union Code.

Boyle Avenue and Old Manchester Road, ST. LOUIS, MO., U. S. A.

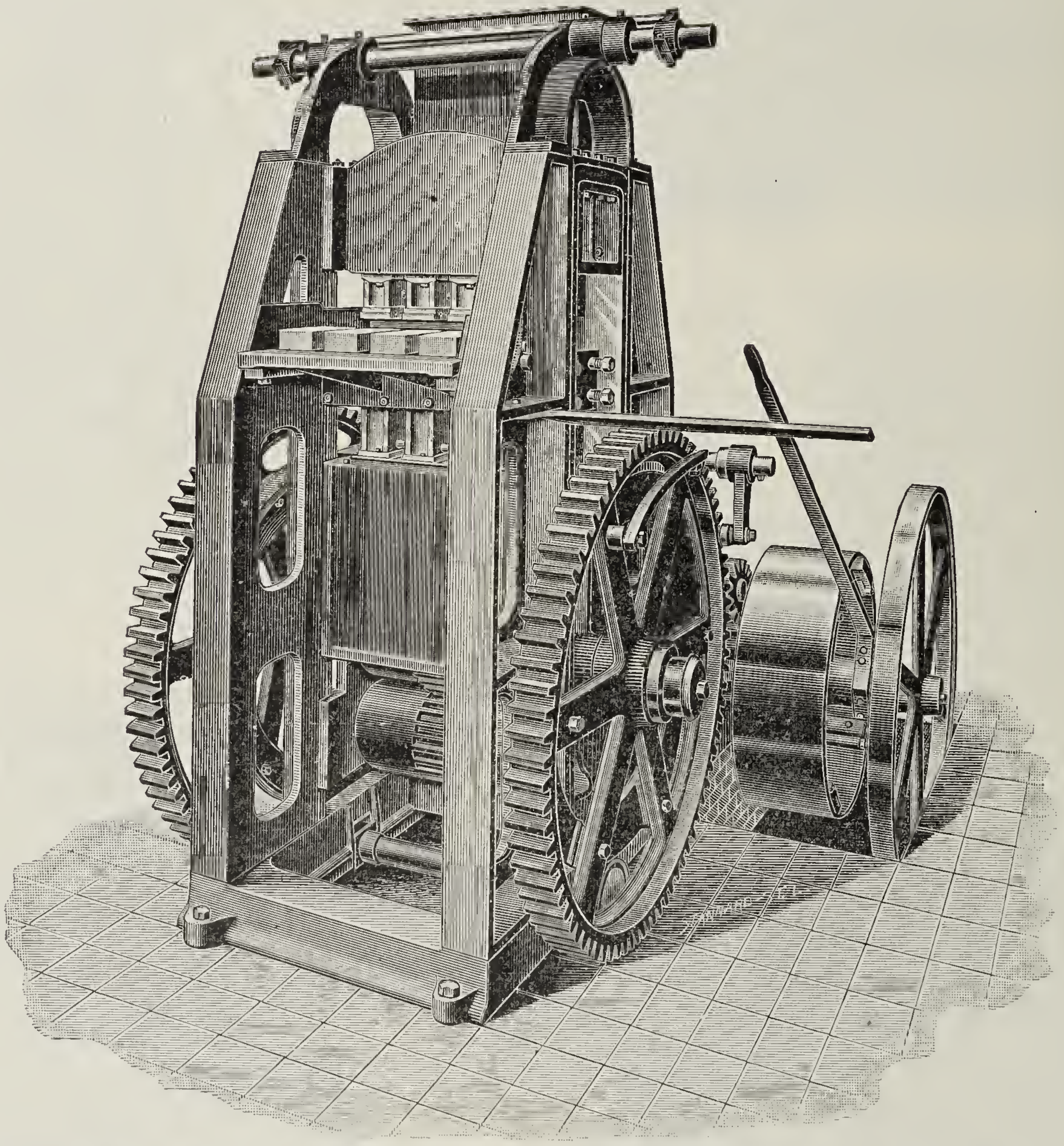
PERFECTION REALIZED

IN THE

RELIANCE DRY PRESS BRICK MACHINE

(PATENTED)

Main
Features:
Strength
Durability
Simplicity
Saves Fuel
and
Costs Less



No
Toggles
No
Links
No
Pins
to
Wear

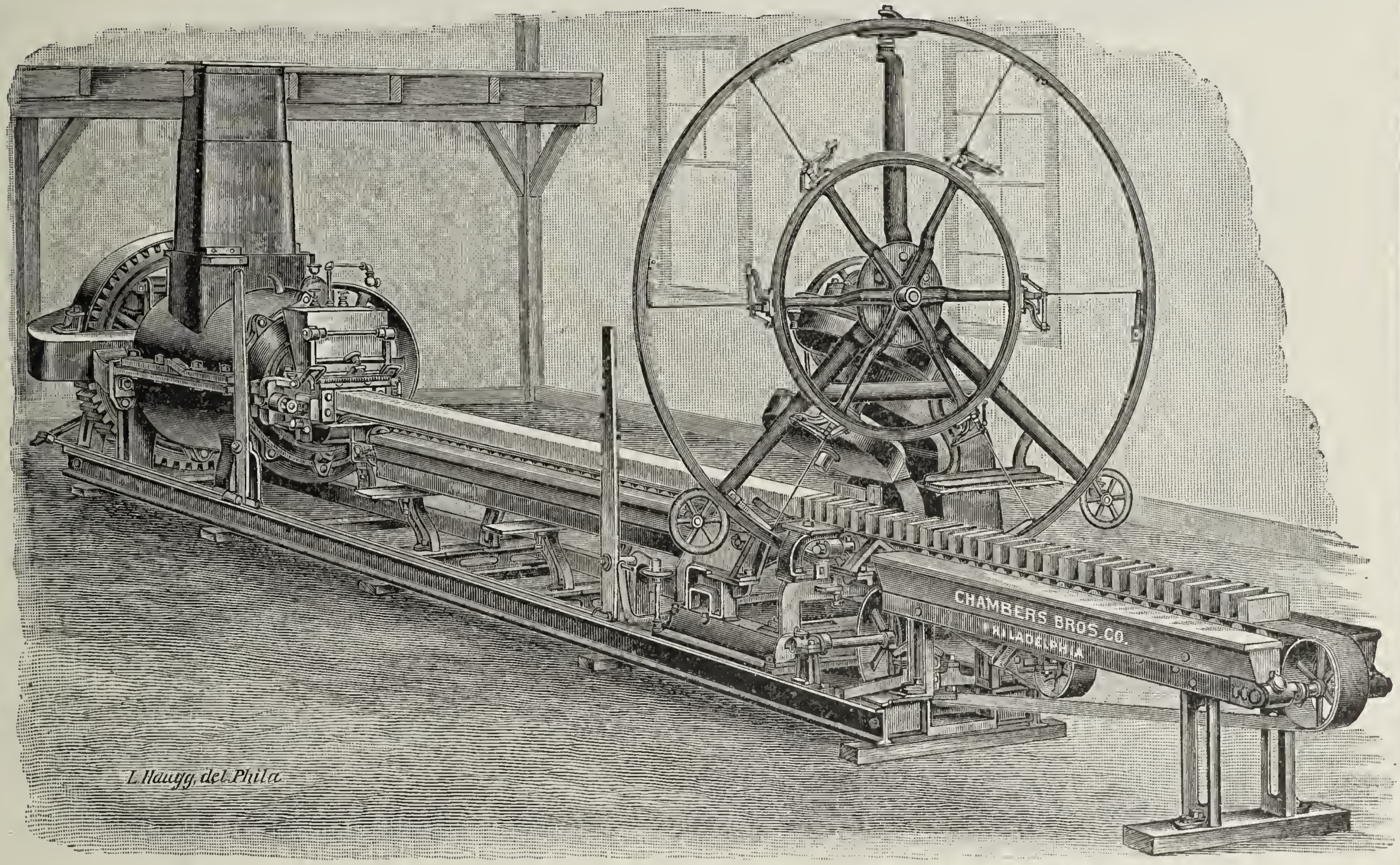
STRONGEST AND MOST POWERFUL BRICK PRESS ON THE MARKET

FOR PRICES AND FURTHER PARTICULARS ADDRESS THE

RELIANCE MACHINE AND TOOL WORKS
ST. LOUIS, MO.

MACHINERY FOR BUILDING BRICK AND FOR STREET PAVERS

ROUND CORNER PAVING BRICK WITHOUT REPRESSING


CHAMBERS BROS. CO.
PHILADELPHIA
L. Haugg, del. Phila.

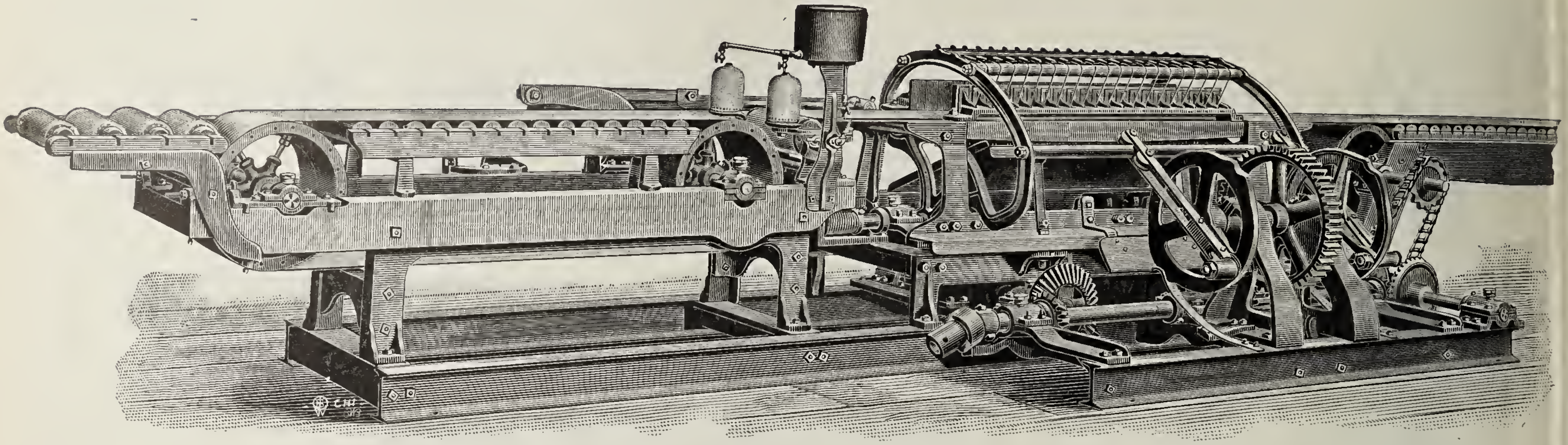
THE CHAMBERS AUTOMATIC SIDE-CUT BRICK MACHINE.

Automatic End Cut Brick Machines of five sizes, having capacity from 10,000 to over 100,000 brick daily under favorable conditions.

CHAMBERS BROTHERS COMPANY

52D AND MEDIA STREETS
PHILADELPHIA, PA.

E. R. FRAZIER, Chicago Agent,
59 West Jackson Boulevard.



The Designs of Brewer

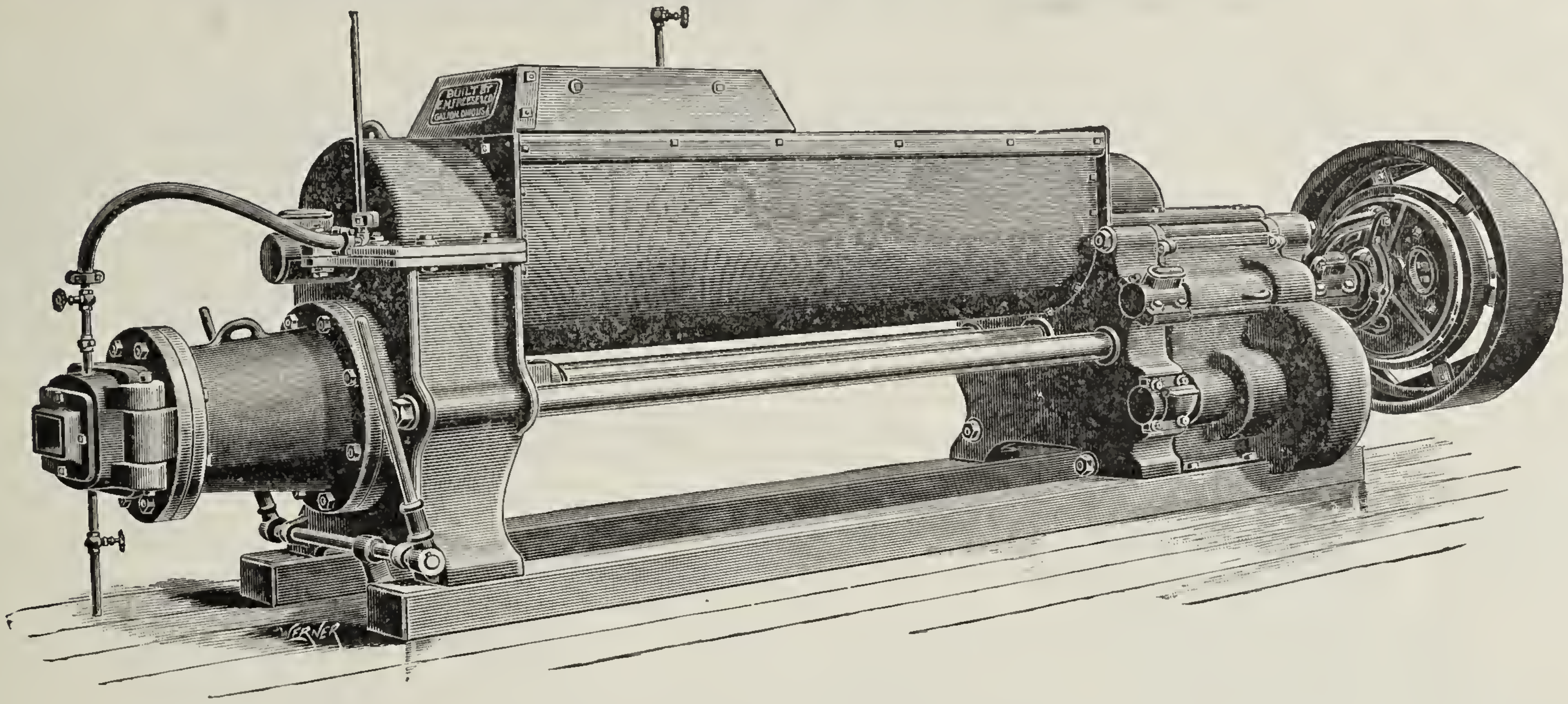
Automatic Cutters

are all of striking simplicity, and it's right there that their popularity originates. Mechanical complications may be all right some places, but not on a brickyard. Simple machines that will do the business are the ones experienced brickmakers are buying now-a-days, and we are selling 'em.

H. BREWER & COMPANY

TECUMSEH, MICH., U. S. A.

UNION BRICK MACHINES



We build these Machines in five sizes. Capacities to 10,000 brick per hour.

Several hundred are in everyday use. They do first-class work and are convenient, economical and durable. This can be verified by investigation.

We also build Brick Machines with separate Pug Mill.

Don't forget our Automatic Cutters. **They give satisfaction.**

State your requirements and let us furnish particulars.

E. M. FREESE & CO.

GALION - - - - OHIO

LAMINATION is the source of more loss, more worry and more anxiety than all other troubles of a brickmaker.

KENTON C READ, Pres. ANDY O'CONNELL, Vice Pres. and Gen'l Mgr C. M. MILLER, Sec.-Treas.

THE

C. M. Miller Mfg. and Mining Co. Inc.

MAKERS OF

High Grade Veneer and Building Brick

Office, 331 Ohio Street.

New Phone 1142.

Terre Haute, Ind. Dec. 22. 1904.

Mr. H. L. Hix, Mgr.
The Wallace Mfg. Co., Frankfort, Ind.:

Dear Sir—I feel that I must tell you my experience with the brick made on the Intermediate Wonder:—

A few days ago a very prominent contractor asked me to bring him some samples of our brick. I fixed up some samples and started to his place, and just as soon as he saw them, he said: "I don't want them—they are no good; I would not lay one of that kind of brick," but I begged him to look at them and tell me why he did not want them. He asked me if he could break one of them, and I said, "Yes, break all of them." So he took his hammer and hit one on the corner; then he looked up at me and said: "I never saw a stiff mud brick like that;" then he broke it all up, just as nice as any brick, and he said: "That is the first stiff mud brick I ever saw without lamination," and that they were all right.

We are now selling our brick as fast as we can deliver them.

Pardon me for taking your time, and with SUCCESS to the WONDER, I am,

Yours very truly,

Andy O'Connell
V P and Gen Mgr.

In the event that you want to make brick filled with LAMINATION, CRACKS and CROOKS, a Wonder Machine will not answer your purpose.

THE WALLACE MFG. CO.

FRANKFORT, IND., U. S. A.

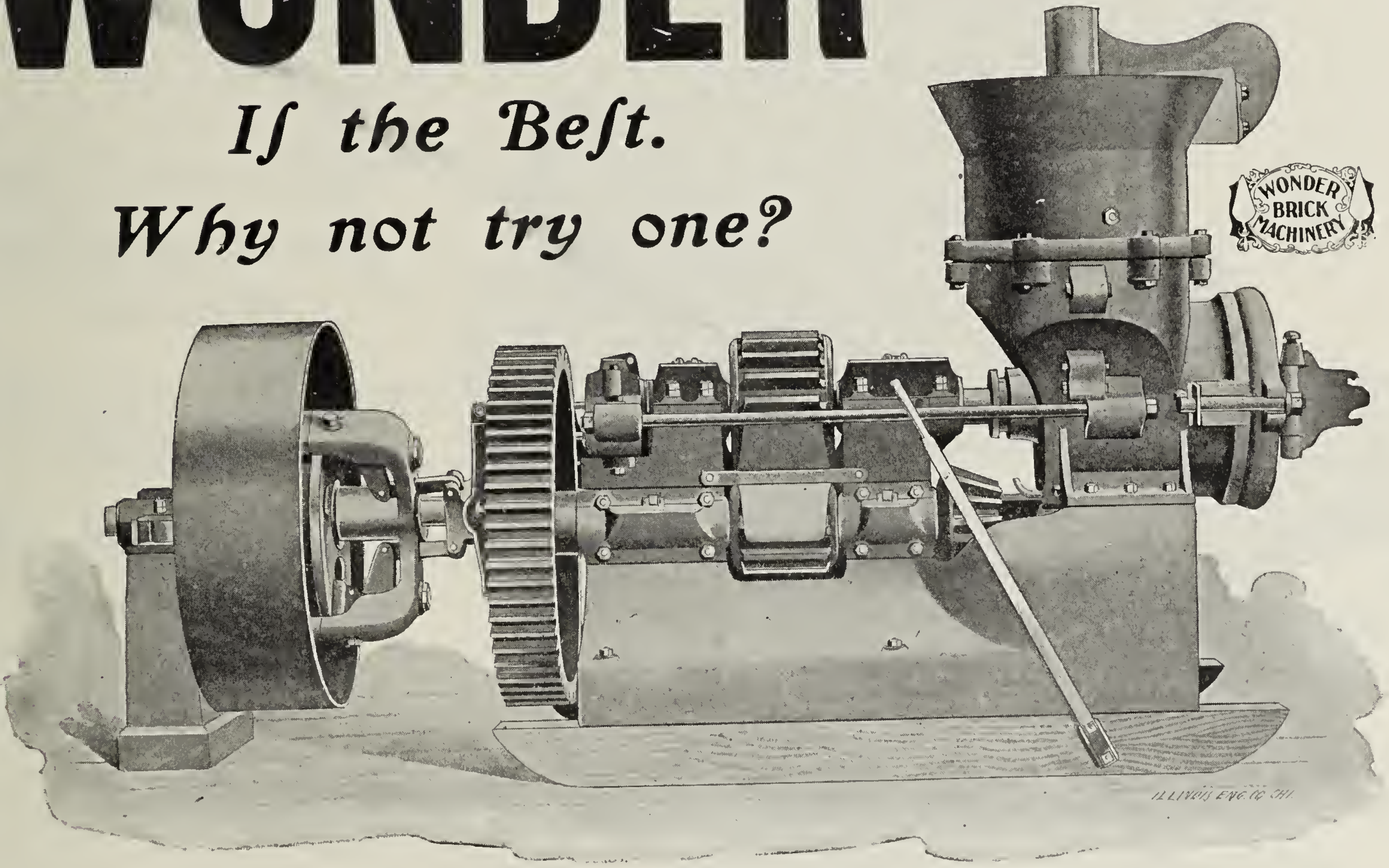
NO DOUBT ABOUT IT—

It is a Fact, conceded by every User, that the

WONDER

Iſ the Beſt.

Why not try one?

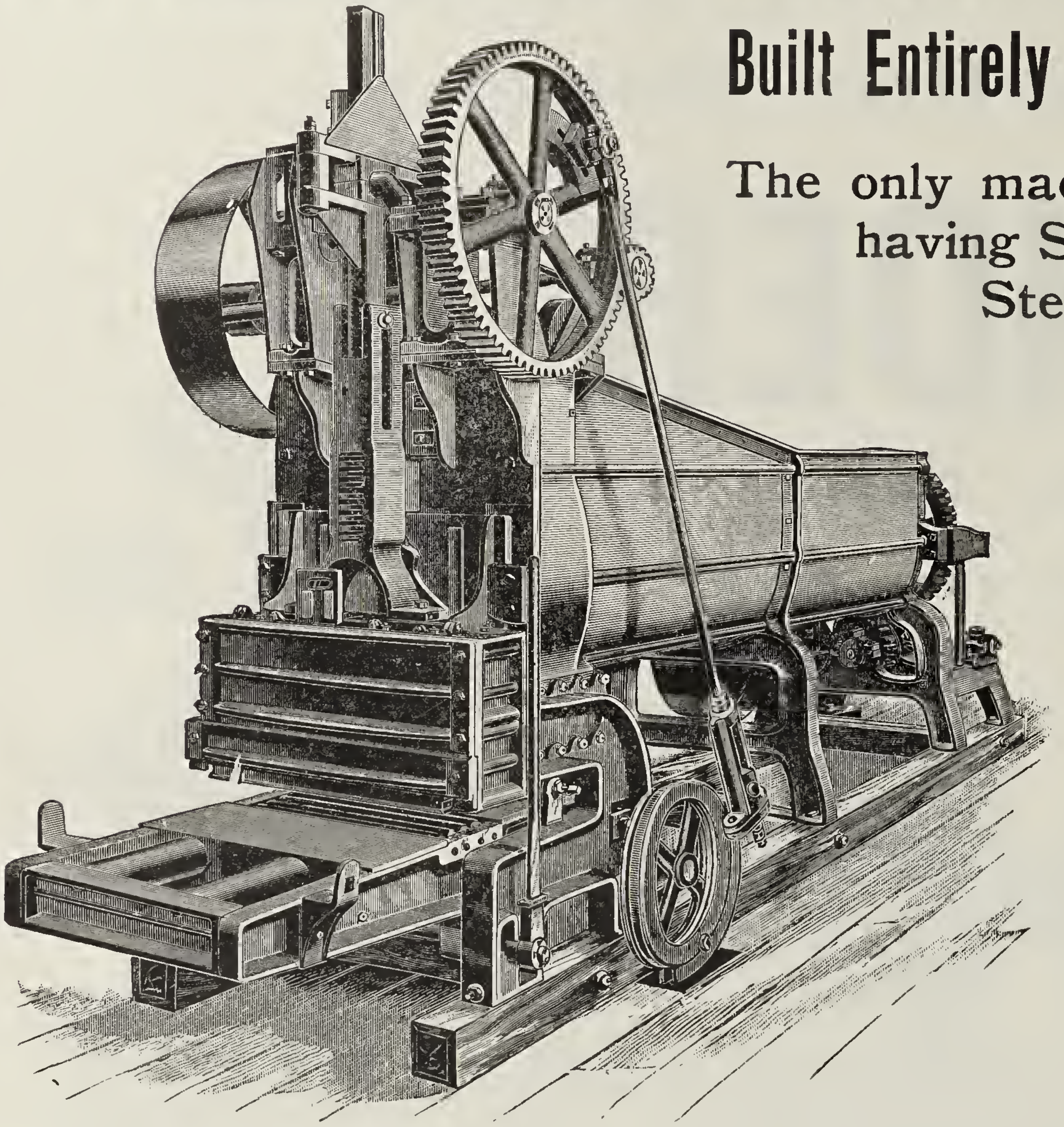


We Have the Best Roofing Tile Proposition ever offered to the trade.
Write Us: Let us tell you about it.

The Wallace Mfg. Co.

FRANKFORT, IND., U. S. A.

THE POTTS
HORIZONTAL BRICK MACHINE



Built Entirely of Iron and Steel.

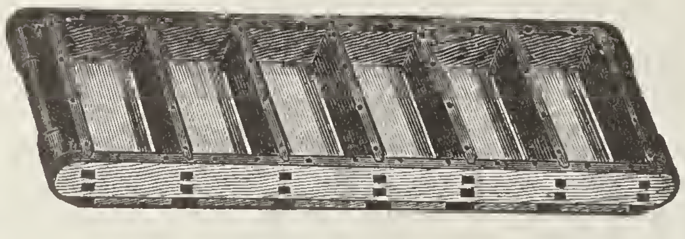
The only machine of this class
having Steel Gear and
Steel Shaft.

Built of the Best
Material by the Best
Workmen.

Simple, Strong and
Durable.

No extra pug mill required to enable working the clay direct from the bank. Its great strength enables working the clay as stiff as practicable, insuring brick which will be STRAIGHT and SQUARE.

THE LEADER OF ALL SAND MOULD MACHINES.



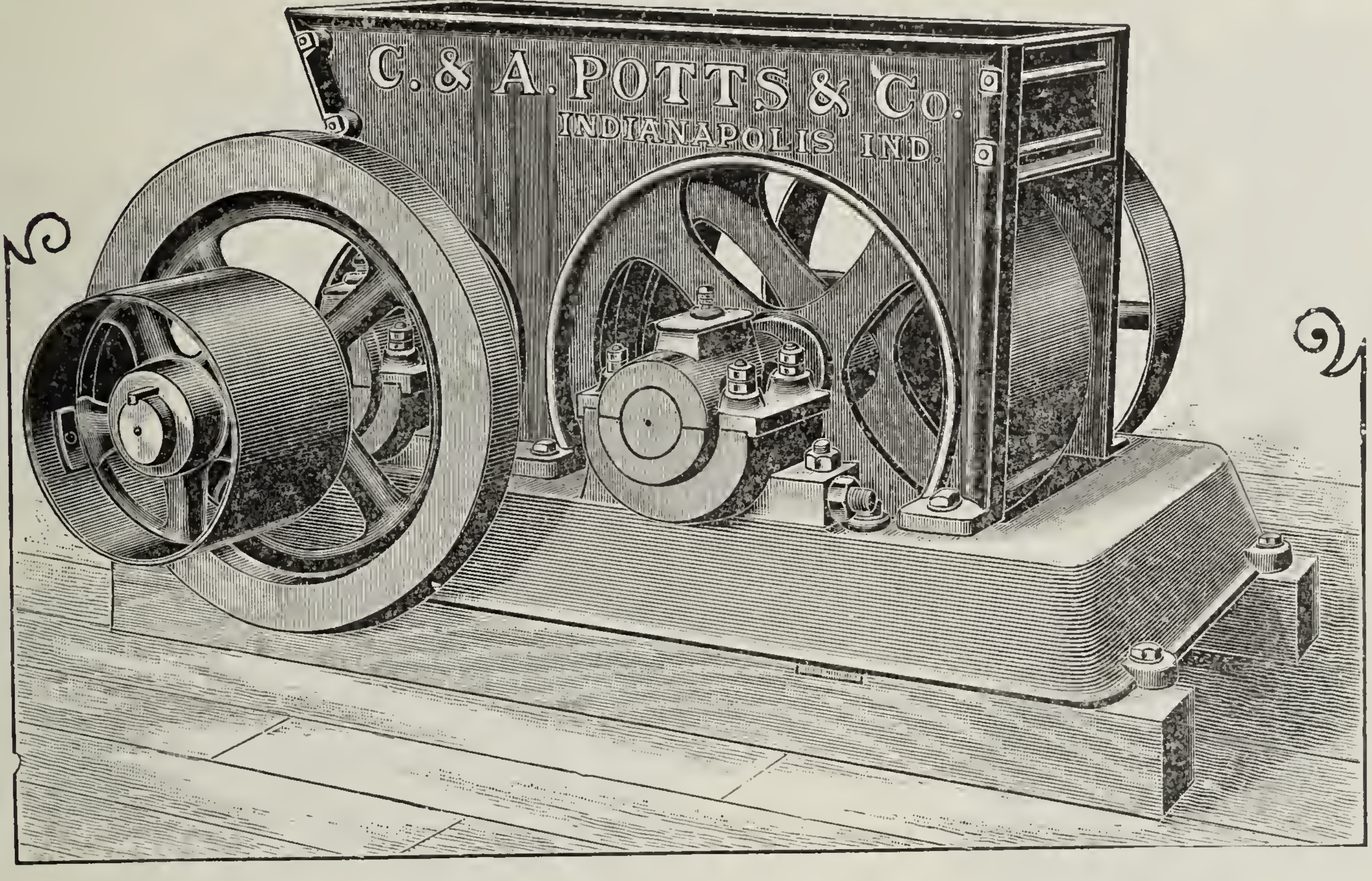
BRICK MOULDS A SPECIALTY

QUALITY IS OUR AIM.

We manufacture a complete line of Brick Yard Supplies. Write for prices.

C. & A. POTTS & CO., Indianapolis, Ind.

THE POTTS DISINTEGRATOR


C. & A. POTTS & Co.
INDIANAPOLIS IND.

Is not a spite machine, but is built the best possible. Having Heavy Chilled Rolls, Ring Oiling Bearings, Shafts of Steel and large in Diameter. The most successful machine for grinding out sticky clays and separating the stone.

THE POTTS MOULD SANDER

Simple in Construction,

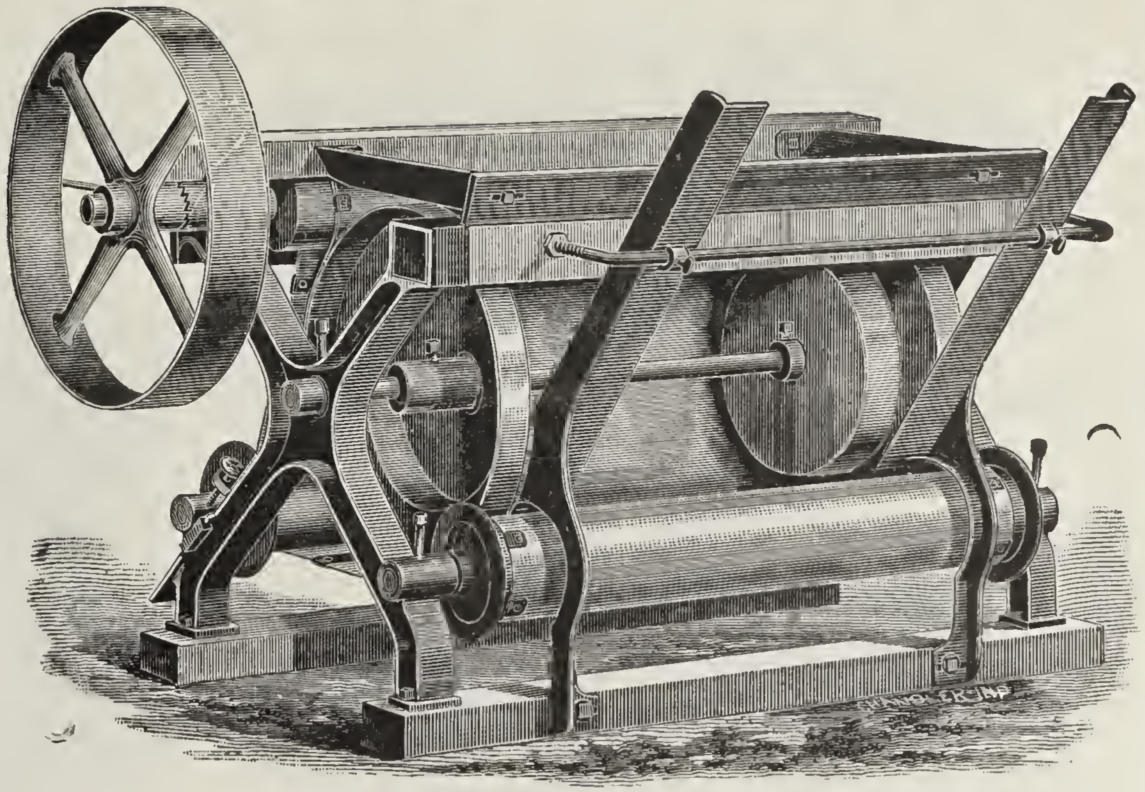
Strong and Durable,

Sands the Moulds Perfectly,

Never Strikes or gets Drunk,

Always Ready for Work,

No Brick Machine Complete without this Machine.



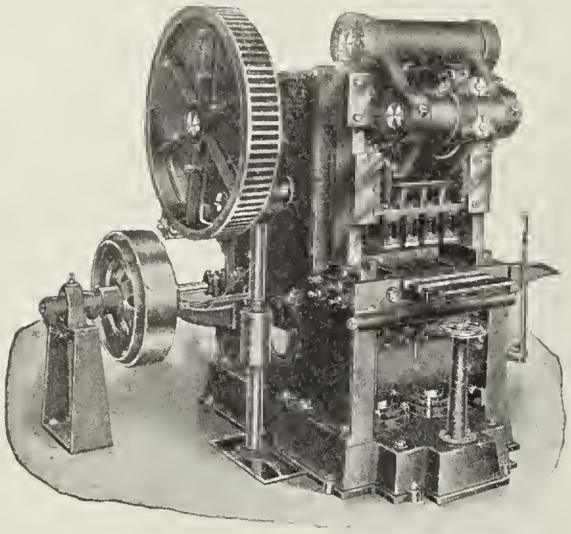
Patented February 5, 1889.

We make a specialty of equipping Sand Mould plants complete. We are the largest manufacturers of this class of machinery in the world. Write for prices.

C. & A. POTTS & CO., Indianaoplis, Ind.

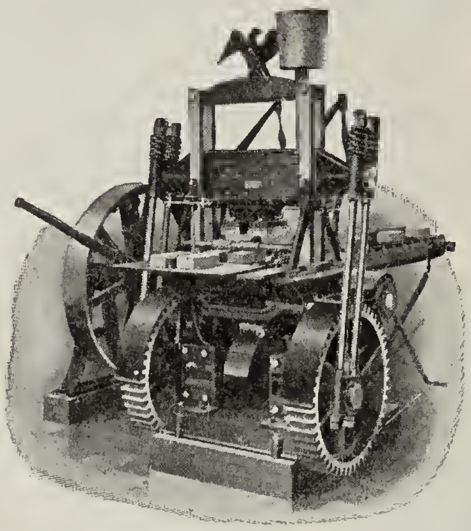
The American Clay Machinery

These are a few of the many Superior machines we manufacture for the Clay Trade. Large cuts



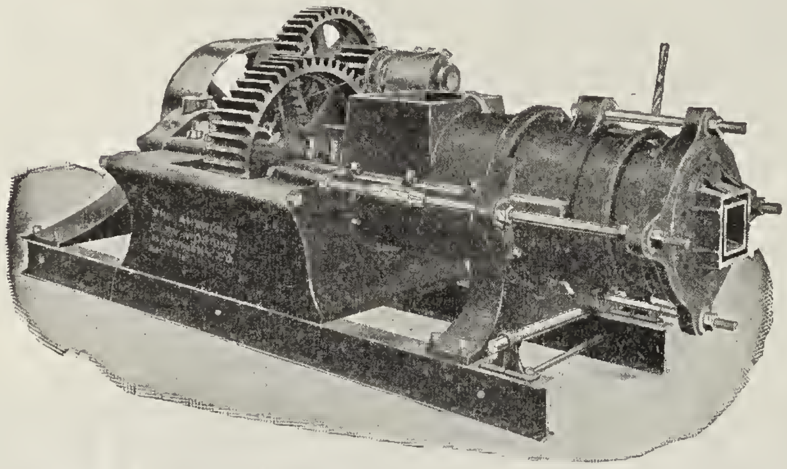
DRY PRESS BRICK MACHINERY.

We build a full line of Dry Press brick machinery. We have four styles and eight sizes, ranging in capacity from 1,000 to 3,000 brick per hour. This cut is our four mold, Moldel B press, especially adapted to Sand-Lime brick. Write for complete catalogue.

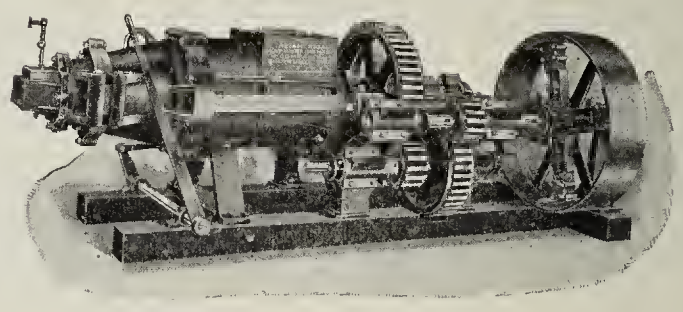


REPRESSES.

We build a large and complete line of represses in six sizes and styles. Capacity runs from 600 to 2,500 brick per hour. Send for our complete catalogue. This cut is of our double mold Eagle Repress.

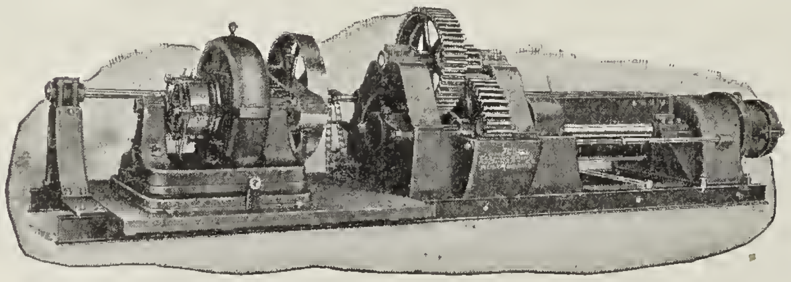


No. 40 AUGUR MACHINE FOR HOLLOW WARE.



No. 2 GIANT AUGER BRICK MACHINE.

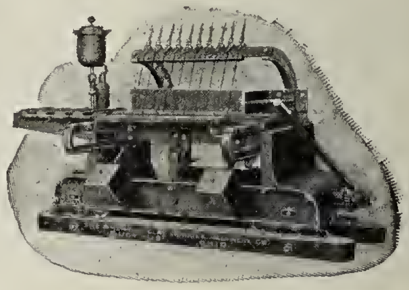
We build ten sizes and styles of Auger Machines. Capacities 1,500 to 10,000 brick per hour. Write for complete list.

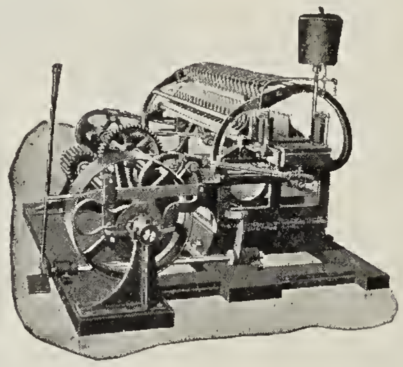


No. 23 ELECTRICAL DRIVEN, LOW FRAME, COMBINED MACHINE.

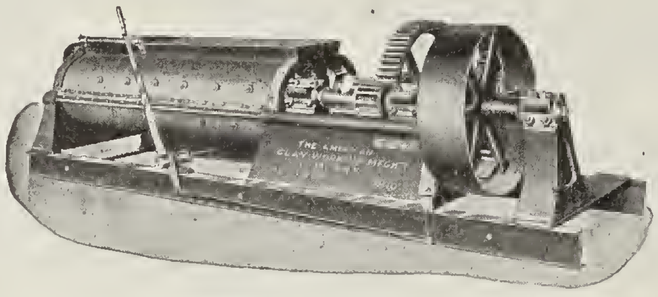
We make a full line of electrical driven clay-working machinery. Send for catalogue.

SEMI-AUTOMATIC AND HAND POWER CUTTERS





We make twenty-five styles of semi-automatic and hand power cutters for brick, tile and hollow ware. Write for full list and description.

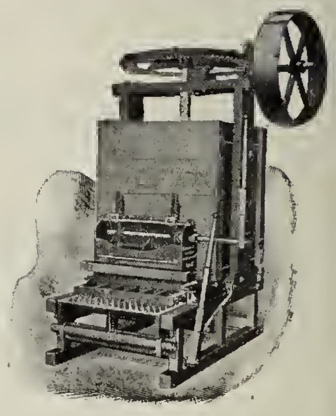


No. 38 DOUBLE SHAFT PUG MILL.

We build twenty different styles and sizes of pug mills to suit the needs of varying clays. Send for complete list and description.

SOFT MUD BRICK MACHINES.

Our Eagle Steam and Horse Power Brick Machines are the best built for small capacity. They are complete with molds, etc. Write for our soft mud booklet. These machines are especially adapted for export.



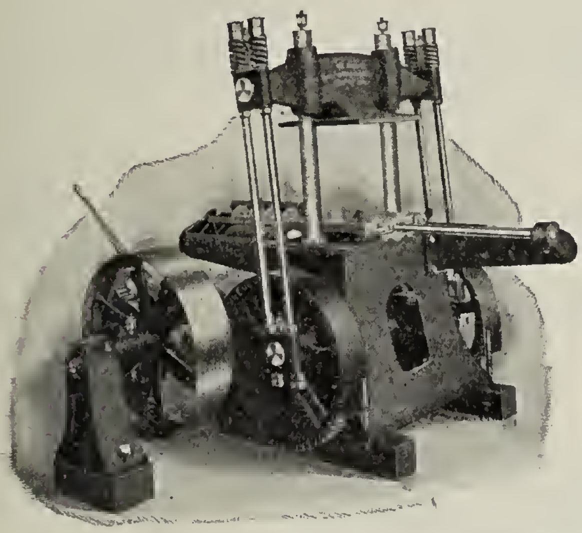
Dry Press, Stiff Mud and Soft Mud Brick Machinery. Sand-Lime Brick Machinery, Cement, and Pottery Machinery. Waste Heat and Steam Dryers

Everything needed by the Clay Workers.

Company, Bucyrus, Ohio, U. S. A.

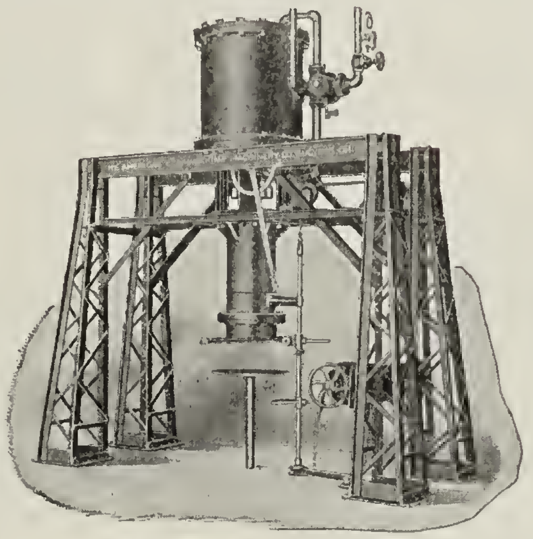
Built Right Run Right

and full descriptions of these and a hundred other machines we make will be sent upon request.



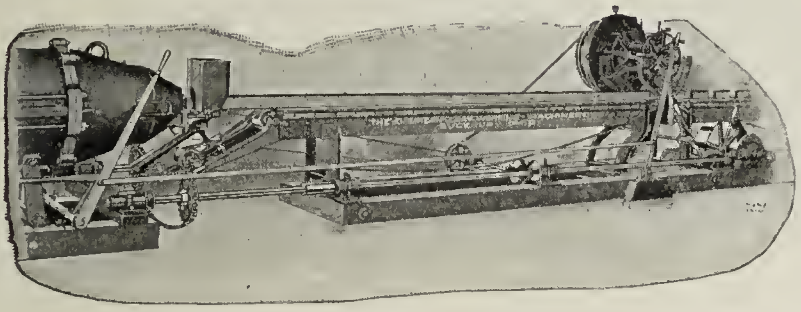
ROOFING TILE PRESS.

We build four styles of Roofing Tile Presses for the pressing of Hip Rolls, Crestings, etc. Write for complete description.



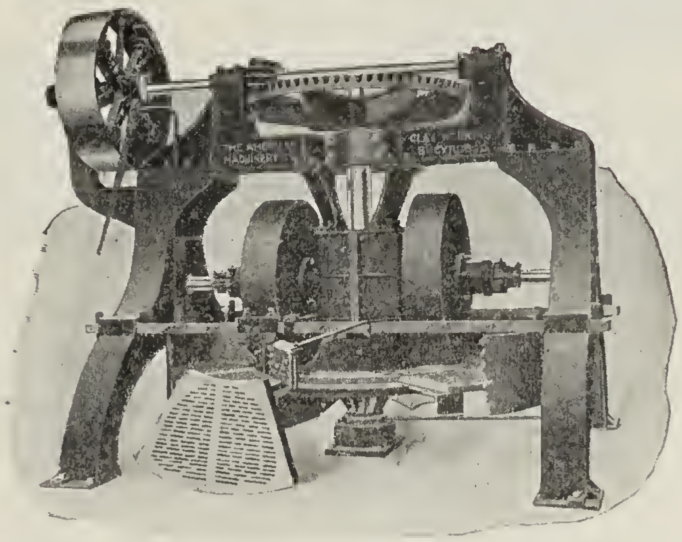
SEWER PIPE MACHINERY.

We build three styles of Sewer Pipe Presses, together with all appliances for a complete plant. Send for our big catalogue.



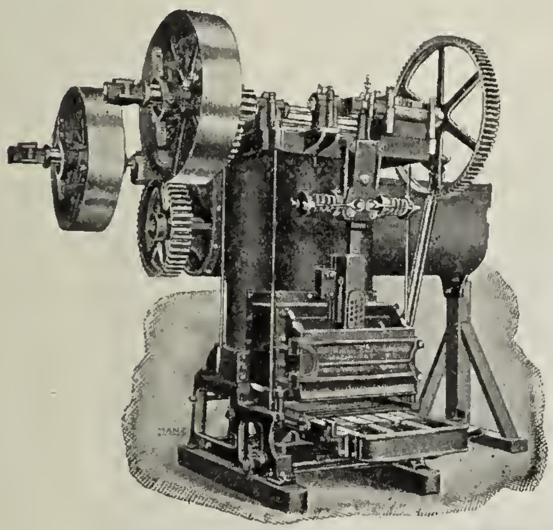
AUTOMATIC, END CUT, BRICK CUTTER, STYLE "P."

For end cut brick this machine is excellent. We build several styles of automatic cutting tables. Write for particulars.



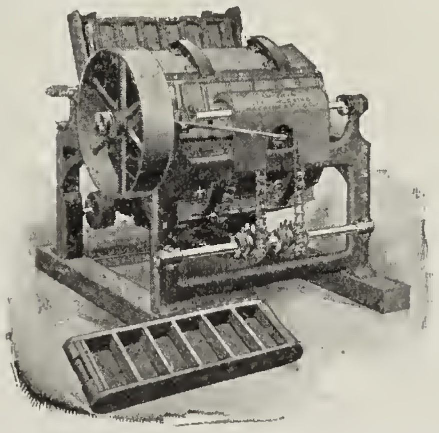
DRY AND WET PANS.

We build twenty styles of Dry and Wet Pans in varying capacity. They are all constructed of iron and steel and are most substantial. A complete description of the full line will be sent for the asking.



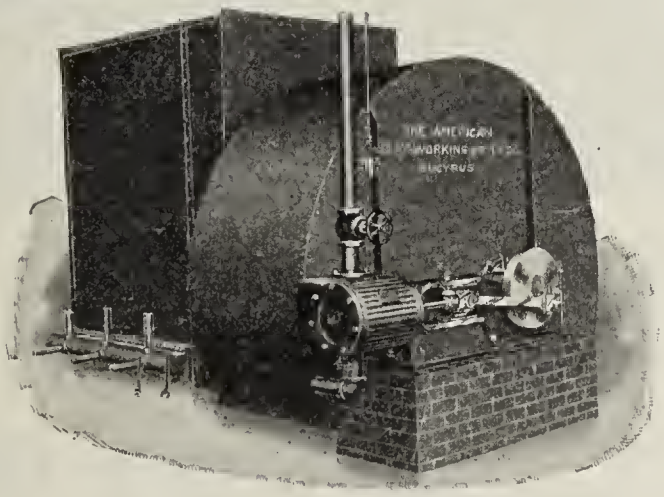
SAND MOLD BRICK MACHINE.

This machine is especially adapted for sand mold brick. It is an excellent machine. Write for a complete description.



CHAMPION MOLD SANDER.

This is an excellent machine and sand molds evenly and economically. It is entirely automatic. Send for description.

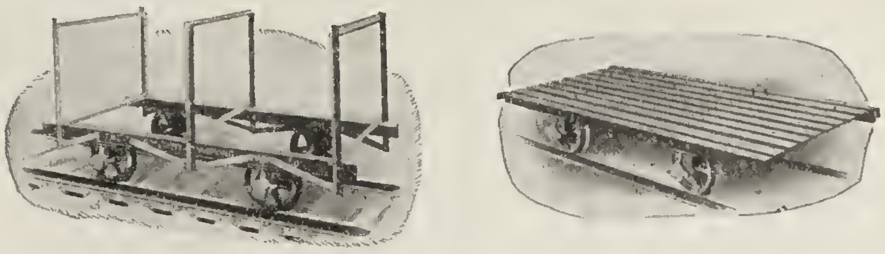


WASTE HEAT AND STEAM DRYERS.

We build both waste heat and steam dryers and can dry the most tender clay. Plans and estimates furnished upon application. We can dry your product at one-half the present cost or less. The cut is of our waste heat dryer outfit.

OUR LINE OF CARS.

We build dry cars and clay dump cars in forty varieties. Send for car catalogue as it is sure to contain just what you want.



THE AMERICAN CLAY MACHINERY COMPANY

BUCYRUS, OHIO, U. S. A.

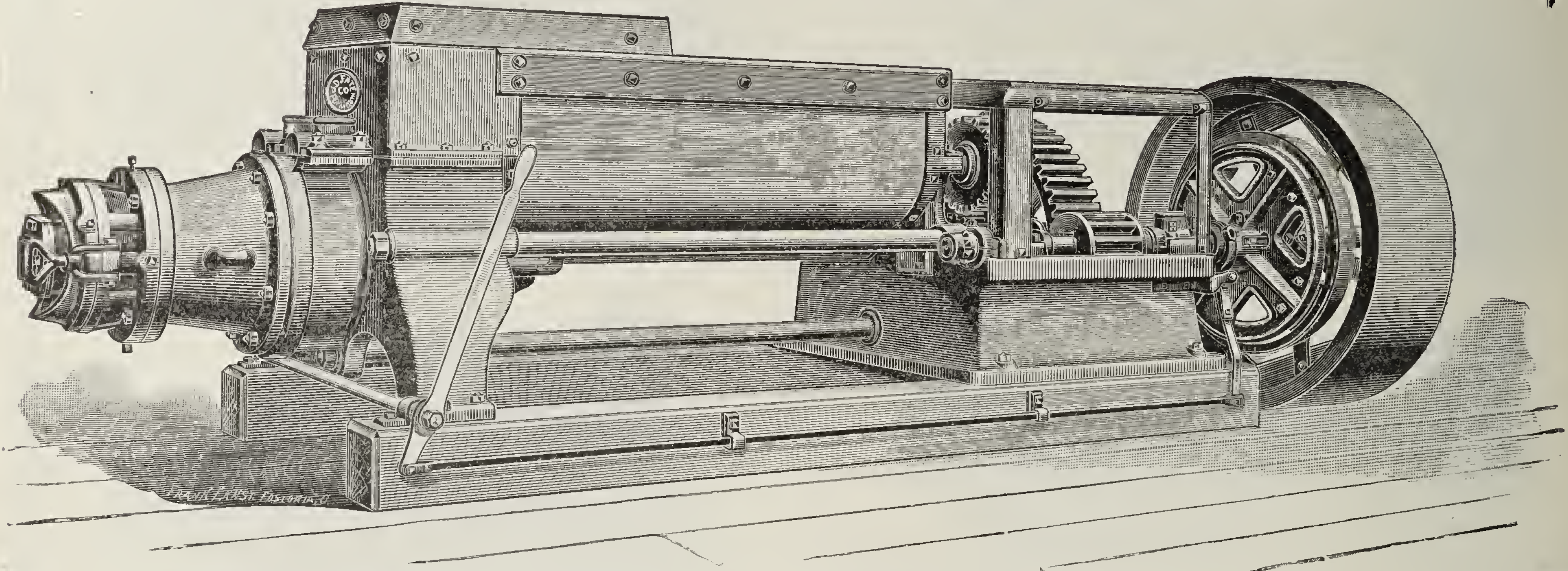
Built Right Run Right

THE PREMIER LINE
THE J. D. FATE COMPANY

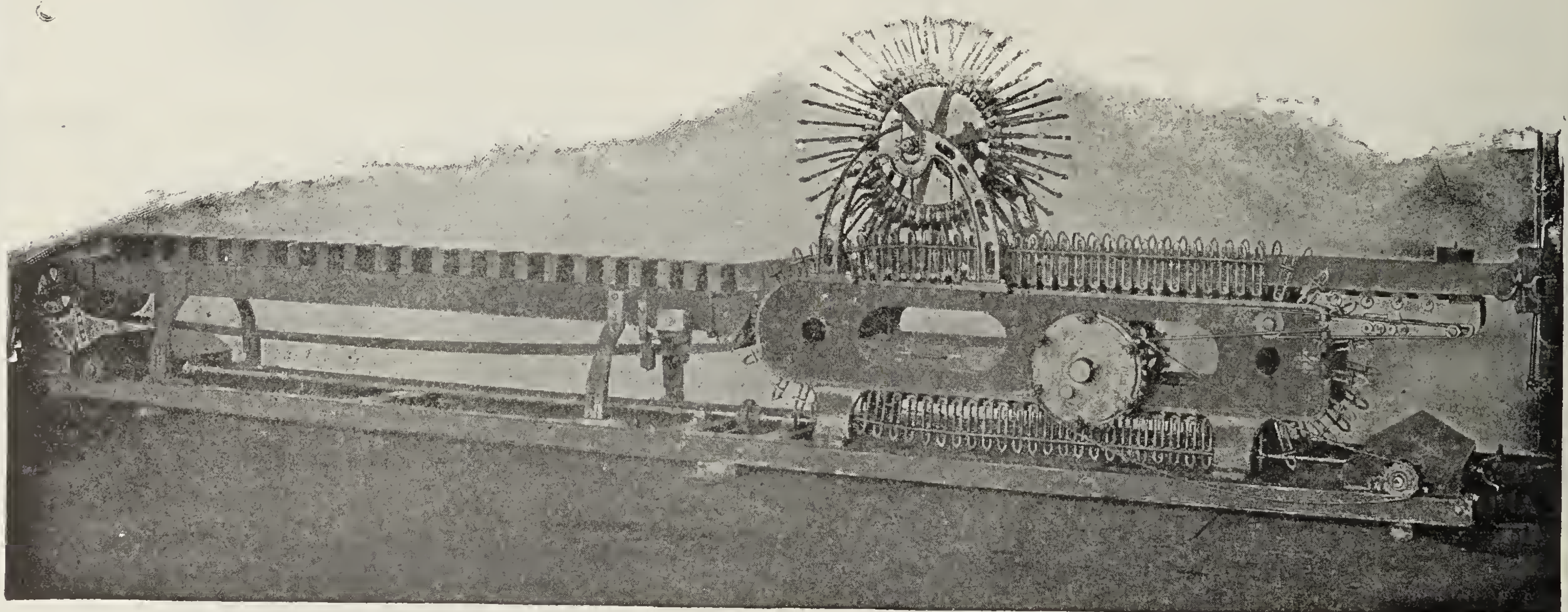
THE "PREMIER"

Combined Brick Machine

THE LARGEST LINE OF AUTOMATIC CUTTING TABLES IN THE WORLD



WITH BENSING'S AUTOMATIC SIDE-CUT BRICK TABLE.



Make a combination of Brick Machinery which is pronounced by practical brick makers to be the most perfect arrangement of stiff mud machinery now on the market.

It is unequaled for strength, durability, capacity and quality of ware produced.

Write us for catalog and full particulars of the "Premier" line of Clay Working Machinery.

THE J. D. FATE CO., - Plymouth, Ohio

WESTERN REPRESENTATIVES:

B. E. LA DOW, 701 Dwight Bldg., Kansas City, Mo.

Pacific Coast: LEW THORNE, Grand Hotel, San Francisco, Cal.

CLAY RECORD

Vol. XXVI. No. 11. CHICAGO, JUNE 15, 1905. Semi-Monthly, $1.00 per Year
Single Copies, - 10 Cents

LIGNITE AS A FUEL.*

By Geo. C. F. Vater, St. Louis.

Mr. President and Gentlemen of the Convention: Your worthy Secretary has honored me with the request to write a little paper on Lignite as a fuel. As this subject is a very timely one, I am the more glad to take it up and to set forth briefly the chief characteristics of this fuel and its requirements for successful use in comparison with coal.

The question of drawing on the enormous riches constituted by the vast deposits of browncoal (lignite) in the states of the South, West and Northwest comes more urgent from day to day as these States are progressing in other respects. To become independent from increasing coal prices and high freight rates, from almighty oil companies means much for further developments of several of these states.

In the places where lignite (browncoal) are found, they will invariably be able to compete with any other fuel. Whether the browncoal (lignite) can be used economically or not, can be derived from simple calculations, where practical experiments have not yet been conducted. We know or can figure how much a certain amount of heat, say 100,000 calories would cost us in our furnaces and kilns if we use bituminous coal. What we have to do is just to find out how much the same amount of heat would cost us if we substitute an equivalent of browncoal.

In many cases browncoal even is to be preferred to bituminous coal, for instance, if it is not as much desirable to obtain a high local heat, as to employ a long soft flame. Such is the case in the kilns of the ceramic industries.

That lignite (browncoal) has not been used so far to any extent in our country as a fuel is due largely to the comparatively young state of the industries in just the localities where browncoal (lignite) is abundant. Now that industries are flourishing and developing in every corner of the country, the figures standing to look for freight rates on coal, raised prices on oil, etc., become more and more significant and impressing in states farther away from the bituminous coal fields.

I have no doubt that the difficulties that have been encountered in the desire of substituting browncoal (lignite) for the other coal so far, will soon be overcome. They have been subdued in the European countries, and browncoal as a fuel is a large factor in their yearly balance.

I will point out the qualities of the browncoal (lignite) which distinguish it from the bituminous coal and show, what requirements we have to fulfill to successfully use it for our purposes.

1. The chief characteristics of browncoal (lignite) is its high contents of moisture, that sometimes exceeds even 50 per cent. Though it seems that American browncoals are better in this respect. As far as my own experience goes they do not contain more than about 20 per cent, freshly mined.

2. The amount of ashes sometimes is very high.

3. Of these ashes mostly a certain amount is very light, so that they are carried along flying by a strong draft.

4. Some browncoals are friable and earthy in structure.

5. Most browncoals will fall to small pieces, when heated in the furnace.

6. The heat value of the browncoal (lignite) is a comparatively low one and stands in accordance with the greater or smaller amount of moisture and ashes, which they contain.

The above points constitute the difficulties that we get in the bargain together with some very desirable qualities.

1. Browncoal does not give a high local heat, which is very beneficial for the furnace.

2. Most browncoals have a long pleasant flame, which tends to transfer the heat a greater distance.

3. Most browncoals do not form cinders, leaving only light, friable ashes, which can be easily removed.

To overcome the above mentioned difficulties the furnaces have to be specially modeled.

1. To remove the water, we necessarily have to employ

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*Read at the last meeting of the N. B. M. A. at Birmingham, Alabama.

heat, and will do this most efficiently and with the least loss in the furnace. In order to obtain the highest heat effect we have to construct our furnace in a way that the freshly charged coal is dehydrated and the dried coal then completely burnt up in the other. In the intense heat of the burning coal the gases expelled from the freshly charged coal must take fire and burn.

2. The high amount of ashes has also to be taken care of, so that they can be easily removed and without disturbing the fire.

3. The flying ashes prove to be a nuisance in some cases. As for instance with boilers this will readily be understood. The narrow flues are liable to fill up soon, requiring frequent cleaning, the ashes besides being an insulator decreases the transmission of the heat to the water.

In ceramic kilns these flying ashes may have a detrimental effect if a certain ware requires a heat which will melt the ashes. In most cases a well constructed furnace which will not allow the ashes to freely enter the kiln proper will suffice, while in others the only means to overcome this annoying difficulty, is to gasify the coal in separate producers.

4. If a brown coal is friable and earthly it is difficult to obtain and keep up satisfactory draft conditions. The furnace has to be specially adapted to this kind of fuel and in many cases to successfully work it, is by means of forced air.

5. For browncoals which fall easily to pieces in heating, forced air has to be relied upon for successful operation.

6. In accordance with the heat value of a certain coal, the amount of coal to be burnt for a certain amount of ware and a certain time is far greater than with bituminous coal. We can imagine therefore that the sizes of furnaces or their number, sizes of flues and the like appurtenances will be altogether different from those in use for bituminous coal.

I am fully aware that the subject treated is perhaps not very interesting to all of you gentlemen, but I shall be amply rewarded, if some brother of the art from the lone Star State, the Dakota's or wherever browncoal (lignite) is abundant and other fuel only can be had at great expense has found some helpful suggestion in my words. I should feel gratified if I should only start some fellow-craftsmen thinking over the "browncoal question," and will certainly always be ready to "talk more detail" and help to "start the ball rolling."

Discussion by Prof Wheeler.

Mr. Vater's paper is very largely based upon data obtained in Germany where a very large amount of this fuel is used, and is an inferior class of fuel. This is not the case with American lignites. There are different grades of lignite coal, and you can no more generalize than you can with our bitumen coal. Take the State of Illinois for instance. You find some very rich coals and you find some very poor ones, and so with lignite. The coal West of Missouri is all lignite, and yet it is superior to many coals of the South and Middle West, so it is a very dangerous thing to so broadly allude to lignite. We have some excellent grades of lignite, some light grades and some very inferior. There is another matter that is far more important and will be welcome news to every consumer of power in this country, and that is the fact that the U. S. Geological Survey carried on tests at St. Louis Exposition (Congress having given a large sum for the purpose of completing surveys or tests on the steam making and gas making values of the fuels of this country,) and they are now conducting a series of tests on fuels from all over this country, and when their results are made known, it will show this light grade fuel known as lignite when converted into gas, and utilized in a gas engine is the most valuable fuel we have, superior to many of our bituminous coals. It is very peculiar, its chemical composition is such that when put in a gas producer, it gives a very large volume of a very good grade of gas. There is little doubt but that it is the power producer of the future. The gas producer is still in its infancy. None of you dispute the economy of the steam in a steam engine. We get from 5 to 10 per cent of the value of our fuel as power. In a gas engine, we are getting from 18 to 20 per cent of the fuel as power. As soon as we have become as familiar with the gas engine as we are with the steam engine, we will be running all our plants by turning coal direct into gas, and turning that into our engines. These Governmental tests will show that lignites have a very high value.

BRICK FAMINE IN LEXINGTON.

Building operations in Lexington, Ky., have taken on such a spurt lately that a brick famine has resulted, and those who wanted brick have been compelled to resort to the resources of the surrounding towns to supply the demand. It has also been instrumental in causing both brick yards, the Fayette and the Lexington, to double their capacity. The Lexington Brickyard has about completed the installation of apparatus for producing double the amount of brick heretofore put out, and the Fayette will soon install.

The cause of the brick famine is attributed to the skyscrapers and other buildings, which required a large amount. The capacity of both brickyards combined is about 75,000 brick a day. There will be no brick put on the market by the local brickyards for several weeks, which means that any one wanting brick will have to wait or make their purchases from Louisville, Cincinnati, Winchester, Georgetown or some other city. At the end of thirty days the supply will be adequate to the demand. The brick are being molded now, and in about fifteen days the burning will begin.

$12.25 TO NIAGARA FALLS AND RETURN.

via Nickel Plate Road, June 18th, 19th and 20th, with return limit of June 24th, or by depositing ticket limit of July 14th may be obtained. Through vestibuled sleeping cars. Three through daily trains. No excess fare charged on any train on the Nickel Plate Road. Meals served in Nickel Plate dining-cars, on American Club Meal Plan, ranging in price from 35c to $1.00; also service a la carte. For further information write John Y. Calahan, General Agent, 113 Adams St., Room 298, Chicago, Ill. Passenger Station at Chicago, corner Van Buren and La Salle Sts., on the Elevated Loop. Chicago City Ticket Offices, 111 Adams St. and Auditorium Annex.

"ARE GAS-FIRING KILNS FOR BURNING FIRE-BRICK ECONOMICAL?"*

By Geo. F. Vater, St. Louis, Mo.

In answering this question the first thing we shall have to say, will be that all depends on what kind of a Gas-Firing Kiln we employ and how we run it.

In the use of producer gas itself there will hardly be any saving in comparison with the common furnace-firing. There is here as well as there plenty opportunity for inevitable losses. The few per cent that may be saved by a little more rational gasification and condensation of the coal and its product are certainly made up by the higher cost of the construction, the coal for making the steam and may be some additional labor. The saving only comes in with the perfect carrying on of a perfect continuous run of a set of chambers. I mean to say by this, that, in order to accomplish the highest profit by the heat yet stored in the combustion gases after leaving the "burning chambers," they should pass through at least four more chambers before entering the stack flue.

To illustrate this, I may give some data from my experience with gas kilns run on a disadvantageous as well as an advantageous plan. A gas kiln, being operated so as to draw the combustion gases only through one additional chamber and to the stack flue, is using an average of 25 per cent bituminous coal. In two other cases with a regular bituminous run I was using 30 per cent brown coal and 4 per cent bituminous coal. The brown coal was a low grade material of which three parts were about equal to one part of bituminous coal. Thus, for comparison, expressing the amount of coal in bituminous, there would have been needed about 14 pounds for 100 pounds ware. Ware and degree of heat employed were identical in all classes; i. e., fire-clay ware and seger cone 9 to 10.

It will be easily understood that 25 per cent coal don't have much chance to figure on economy, while it is evident without figuring that 14 per cent allows a nice profit in comparison with the common and patented down-draft kilns.

In addition to the saving in coal it is to be claimed for the gas kilns that all the ware is nice looking and clean, which means, that there is another saving against the old-time kiln which always renders a certain number of spoiled brick or other ware.

I dare not forget to mention that one of the economical features of the gas kiln comes in with the grade of coal that may be used. The results don't show in the percentage of course, but in the coal bills.

The figures given above apply to good coal. But in producers most any kind of coal may be used, provided the producers are proportioned and designed accordingly. Of a low grade coal of course a larger amount is necessary, as is seen with the brown coal (in two of the mentioned cases) which contained more than 50 per cent water and pretty much ashes. But the price of the low grade coal generally is disproportionally low compared with its fuel value. In one case I recently struck on an instruction trip, a glass works which had a slag coal at 15c on produce platform and wanted to use it. Their trouble came in with not being able to produce a gas of good quality and enough of it. Besides they had to contend with huge hard clinkers. After some change in the arrangement of the producers and with a proper manipulation, I had good gas and plenty, even more than necessary, and the labor for taking out the clinkers was reduced to one-third. The saving in using the slag coal against the next better grade, which otherwise would have had to be taken in consideration, counting in all labor, etc., amounted to about $70.00 per week in this case.

Finally there may easily be found reasons for assuming economy in the concentration of the burning part of the manufacture.

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*Read at the last meeting of the N. B. M. A. at Birmingham, Alabama.

SAVING AND WASTE IN SMALL STEAM PLANTS.

An interesting case of improvement in the economy of a small power plant has recently come before our notice. In the plant in question steam was required to heat a small building and to supply an engine developing 20 to 30 indicated horsepower for about ten hours per day. For this purpose two boilers were employed, one an old type heating boiler furnishing steam at low pressure for heating purposes, and the other an old and decrepit tubular boiler for the engine. A good grade of stove coal was burned in each costing about $5 per ton. Under these conditions the daily consumption of coal during the winter months was about one ton. In due course of time these old boilers were taken out and replaced by a modern boiler of the usual fire tube type. The grate of this boiler, both in extent and form of grate bar, was designed for rice coal instead of the more expensive fuel which had been previously used. At the same time the engine, which was simple and non-condensing, was arranged to deliver its exhaust into the steam heaters, and thus to utilize the exhaust steam for heating purposes instead of throwing it away entirely, and then providing by a separate boiler the steam required for heating.

Under the same general conditions as before, and without further engineering refinement, the consumption of fuel has been reduced to about one-half ton of rice coal as compared with the ton of stove coal formerly used. This means a net saving of about $4 per day in the fuel account. During the summer months the saving will be less, but it is within the limits of probability to count on a saving of about $1,000 per year simply in the fuel account.

With some further improvement, such as an exhaust feed-water heater, improved non-conducting covering for the boiler and piping, a still further saving may be expected.

It may of course be said that the first conditions were excessively wasteful, and such indeed was the case. At the same time there are only too many just such wasteful little steam plants scattered throughout the length and breadth of our land, and while in many of them the conditions would not permit of so large a relative financial saving as that described above, still the illustration given may be taken as a fair example of what may be saved under conditions of this general character. Again, it may be noted that the new plant referred to is by no means in the front rank of engineering practice. The installations, old and new, in fact involve only the simplest of everyday engineering, and may be taken as a good illustration of the way money may be wasted or saved in the fuel account of an ordinary small steam and power plant.

ANOTHER SAND-LIME PLANT ON THE HUDSON.

One of the most interesting Sand-Lime Brick Plants in the country is the one recently started by the Newburgh Brick Co., of Newburgh, New York, on the Hudson River.

Newburgh is the county seat of Orange County, N. Y., situated on the west bank of the Hudson River, fifty-five miles north of New York City. It has manufacturers and a river trade, being a shipping port for coal. It is noted for many historical events and was the headquarters of George Washington during the Revolutionary war. The American navy disbanded here in 1783. Washington, LaFayette, Aaron Burr, "the patriot," and Benedict Arnold, "the traitor," visited the place.

Two anonymous letters to the American Navy were sent from Newburgh by John Armstrong, the American general, politician and diplomat, setting forth the grievance of the soldiers, chief among which was the arrears of pay.

This plant was built last fall to supply brick for the New York market, but owing to the severe weather was not completed in time to run during the winter, so operations were deferred until spring. The New York market demands a very high grade of brick, and all building material going into that market must pass very severe tests and rigid inspection. This makes the conditions unusually severe for a new industry, but the sand at Newburgh seemed to meet all requirements, being of exceptionally fine quality for this class of work. It makes a strong, heavy, solid brick with good edges and corners, and is very low in absorption. The brick are the color of light granite, and seem to be taking remarkably well, as although the plant started in April and has been running continuously, they cannot keep up with orders.

The president of the Newburgh Brick Co. is Geo. R. Mitchell; vice president, James S. Taylor; secretary, W. Johnston McKay, and treasurer, Wm. T. Hilton. Mr. J. F. Scott is superintendent, and has entire charge of the manufacturing. Mr. Scott has had a great deal of experience in the practical end of the Sand-Lime Brick business, having had charge of several plants in the west before going to Newburgh.

The sand used is taken from the banks of the Hudson River. It is of a reddish color and is rather coarse, so that it was necessary to equip the plant with a Sand Grinder, which reduces a portion of the material to supply the necessary fines to make a dense brick, low in absorption. The plant is also equipped with a Sand Dryer, and the material is first thoroughly dried to obtain the best results from the Grinder and Mixer.

Plant of the Newburgh Brick Co., Newburgh, N. Y.

The lime used in this plant is a Magnesian Lime, and has the following analysis:

Calcium Carbonate	54.23
Magnesia	39.41
Silica	3.96
Oxide of Iron	.26

It is claimed by many that in order to make Sand-Lime Brick successfully a high calcium lime is absolutely necessary, but the success of the Newburgh Brick shows conclusively that with the proper treatment a very high grade brick can be made from a dolomite lime with practically 40 per cent of magnesia. This ought to settle the question definitely as to the absolute necessity of having what is called a high grade or fat lime for this work.

The lime is hydrated before mixing with sand, which is done after the grinding. The proper proportions of lime and sand, after being automatically measured, are fed to the mixing mill, from which they go directly to the press, no bins or silos being used. This makes a continuous process, and so far as the writer could see it was entirely automatic, the only handling being of the brick from the press to the cars. So far nothing seems to have been devised to take the place of man-power for this part of the work.

The power for the plant consists of a 13″ x 18″ Atlas Engine, and a 72″ x 18″ Tubular Boiler. The power and the entire machinery equipment was furnished by the American Sand-Lime Brick Co. of Chicago, and the plant is operated under the American System.

One notable thing about the starting of this plant is that the brick made in regular work proved to be superior to the sample brick submitted by the contracting engineers before the plant was started. In view of the experience of many of the Sand-Lime Brick Plants in the country when first starting up, this may look like a fairy story; but the company states that it is an actual fact. The brick have recently been tested at the Columbia University by Professor I. H. Woolson with the following results:

COLUMBIA UNIVERSITY.

IN THE CITY OF NEW YORK.

Machine used, Emery, Hydraulic. Date, May 15, 1905.
Tested by Ina H. Woolson, E. M. Made for C. J. Curtin.

REPORT OF COMPRESSION TESTS.

Material. Sand-Lime Brick.

Test Number	3559	3560	3561	3562	3563
Mark on Test-Piece	1	2	3	4	5

Shape of test-piece, half-brick resulting from Transverse Tests. How tested:

Bedded with Blotting Paper.

Height, inches	2.33	2.34	2.32	2.30	2.34
Width, inches	4.00	4.00	4.00	4.03	4.08
Length, inches	3.93	4.40	3.98	4.26	3.95
Area, sq. inches	15.72	17.60	15.92	17.17	16.12
First crack, lbs.	35,900	40,900	41,300	45,400	34,000
Maximum load, lbs.	45,100	54,800	41,600	62,300	65,700
Ultimate strength lbs. per sq. in.	2869	3114	2613	3629	4077

TO ASBURY PARK, JULY 3 TO 7.

The most attractive eastern excursion during the coming Summer will be to Asbury Park, N. J., on occasion of the Annual Meeting of National Education Association, July 3rd to 7th, inclusive, via the Nickel Plate Road and its connections, either the West Shore or Lackawanna Road, with privilege of stopover at Chautauqua Lake points, Niagara Falls and New York City. Rate $21.35 for the round-trip. Dates of sale, June 29th and 30th and July 1st and 2nd, with extreme return limit of August 31st, by depositing ticket. Patrons of this route may have the choice of a ride over the most interesting mountain scenery in New York and Pennsylvania, and through the celebrated Delaware Water Gap, or through the beautiful Mohawk Valley and down the Hudson River, which also includes the privilege of a ride on day line boat on Hudson River, between Albany and New York City, in either direction, if desired. No excess fare charged on any train on Nickel Plate Road. Meals served in Nickel Plate dining cars, on American Club Meal plan, ranging in price from 35c to $1.00; also a la carte. Chicago Depot, La Salle St. Station, corner Van Buren and La Salle Sts. City ticket offices, 111 Adams St. and Auditorium Annex.

For further particulars address John Y. Calahan, General Agent, 113 Adams St., Room 298. Chicago.

PAVING BRICK MEN HOLD A MEETING.

The national board of the National Association of Paving Brick Manufacturers, an infant organization which is just rounding out its first month of existence, was in session at the Great Southern hotel, Columbus, O., laying out plans for future work and getting things in shape for a campaign of education which the association has decided to conduct.

The association was organized to promote the sale of paving brick, by showing people the fine streets which can be made with them. The first meeting was held in Cincinnati in April, and the next on May 25, when the organization was completed. Officers were elected as follows: Will P. Blair, of Terre Haute, Ind., president; W. S. Purington, of Galesburg, Ill., vice president; Chas. N. Crook, of Youngstown, treasurer; Spencer M. Duty, of Cleveland, secretary. All of these were at the last meeting as were a number of other men, members of subsidiary boards.

"The association is practically one of the paving brick men of Ohio, Indiana and Illinois, where the most of the paving brick is manufactured," said Secretary Duty. "Ohio makes more paving brick than any other state in the union. Ninety-five per cent of our members are in the three states named.

"Positively there is no intention to attempt to control prices. The history of gentlemen's agreements are a lesson, and there is doubt in my mind if you could get ten manufacturers in the state to even consider such a proposition. Innumerable times in the past ten years efforts have been made to control prices, but they have been a failure.

"At one time it went so far that a central organization was formed to sell all the output. The officers of the organization not only never got their salaries, but they had to pay the office expenses out of their own pockets.

"We find in many cities the people do not know the value of brick pavements, and in other places there is a prejudice against them, because the engineer in charge had not understood how to lay them. The association will try to educate not only the people, but the engineers. We are here to make our plans.

"Very likely the method agreed upon will be to take committees of citizens, councilmen and engineers to Cleveland, Terre Haute and other cities where the finest brick pavements have been laid, and show them what can be done. Cleveland has more brick pavements than any other city in the country."

WESTERN BRICK CO. BREAKING RECORDS.

The big plant of the Western Brick Co., Danville, Ills., has been breaking records lately in the size of its shipments. On May 29, the company shipped 34 cars of brick and on June 1, this feat was repeated. The brick went to Peoria, Indianapolis, Chicago and other points.

Previous to this, the largest shipment the company had ever made in one day was 29 cars, this having been done several times last year. The shipment of 34 cars is said to exceed that of any brick plant in the west. Thirty-four cars means a shipment of about 360,000 brick.

GLASS PAVING AND BUILDING BRICK.

GERMANY.

So far as can be ascertained, no glass paving bricks proper have been made or even tested in this district under such conditions as to afford a basis for rational conclusion as to their permanence, their cost as compared with other paving material, or their general desirability for that purpose. The editor of the Gas Industrie, the central organ of the German glass and ceramic industries, states in reply to an inquiry, that Lyon, France, is the only city known to him in which glass paving bricks have been most thoroughly and systematically tested, but the exact results of such tests are unknown here. Translucent glass tiles 5 or 6 inches square by 1 inch in thickness, are used for paving walks over cellars and subterranean vaults, engine rooms, and other places where more or less light is required to pass through the pavement, but this is a branch of the subject somewhat aside from the scope of the inquiry. No official or technical experiments appear to have been made in Berlin with glass blocks for paving streets and roadways.

There are, however, three firms in eastern Germany, viz, the Glashüttenwerke Adlerhütten at Penzig, near Görlitz, Silesia, the Actiengesellschaft für Glasindustrie in Dresden, and Gebrüder Striet, of Berlin, whose factory is in Silesia, all of whom make bricks of glass, not for paving, but for building purposes, in which the blocks, more or less translucent, are laid up in walls like bricks of ordinary character. At the international exposition of fire-extinguishing and fire-preventing devices, held in Berlin in 1901, the second of these companies exhibited a small chalet or villa, the walls of which were built of such bricks in several shades of dark green and blue, which attracted attention as a novelty. The avowed purpose of the exhibit was to demonstrate the merits of such material for resisting fire, and in this respect the tests, so far as can be ascertained, resulted satisfactorily.

Messrs. Streit manufacture in two shades—white and green—glass bricks which are especially adapted to the construction of walls and buildings where light, cleanliness, and neatness of appearance are specially desired. They are made in two sizes, both 2 inches thick, 2¾ inches wide, and 5 and 10 inches long, respectively, the short brick being half the length of the full-sized one. The edges are made with flanges which fit into countersunk recesses, so that the bricks may be laid, with very little cement, into air-tight and very firm, although thin, walls, and have a special fitness for many purposes, although their fire resistance is of course limited to the melting temperature of glass. They cost, by the list, 11 cents each for the large and 9 cents each for the small size, from both of which list prices there is a discount of 35 per cent for quantities exceeding 1,000.

Frank H. Mason, *Consul-General, at Berlin.*

Paving bricks from glass are manufactured by the Glashüttenwerke Adlerhütten Actiengesellschaft, at Penzig, Silesia, Germany, about one hour's ride by train from Dresden. This firm owns and works the German patent No. 91203, issued to Louis A. Garchey, of Paris, France, on March 21, 1896, the claims of which read as follows:

1. A process for the manufacture of objects from devitrified glass, consisting in bringing about devitrification already in the raw mass before forming the object.
2. A mode of carrying out the process, consisting in starting the devitrification of the raw mass in heating furnace and finishing it in a melting furnace.

The product is known as "keramo," and is successfully used as a covering for floors of railroad stations, warehouses, engine rooms, stables, and for sidewalks, staircases, etc. It surpasses in point of hardness and wearing quality the very best Swedish granite. The bricks, or rather plates—for they average only 1 inch in thickness—are each about 8 inches square, and are laid out on cement mortar in the manner of the "Mettlacher plates." The power of resistance against pressure and frost is proved, for plates in the natural state stood a pressure of 4,050 pounds per square centimeter (0.155 square inch), and plates, after a frost test, stood a pressure of 4,060 pounds per square centimeter. Keramo plates are absolutely acid proof. In the adhesion test the resistance equaled 32 pounds per square centimeter. For tearing loose an 8-inch square plate laid out in cement a pulling force of over 12,500 pounds was required.

The prices for 25 plates (each 8 inches square) to the square meter, f. o. b. works, are $2.50 first quality and $1.80 for seconds. The weight of the square meter is about 100 pounds.

The same firm manufactures glass bricks for building purposes (system "Falconnier," patented). The bricks were exhibited at the Chicago Exposition in 1893 and received first awards. I remember the glass-brick pavilion in front of the horticultural building and the interest it aroused at the time. The bricks are made of blown glass, and owing to their hollow, closed form are excellent temperature and noise insulators, and do not sweat or freeze. They are cemented together with mortar made of 3 parts sand, 1 part Portland cement, and enough white lime to render the mixture easily workable. These bricks are manufactured in various sizes, shapes, and colors, and average from 3½ to 16 cents each.

A recent patented improvement consists in the application of a wire mantle. The price of the bricks is thereby only slightly raised, while the stability is greatly enhanced. The wire-mantled bricks are set up like ordinary bricks, with hardly any breakage.

For ventilation of glass-brick buildings, a special ventilator is constructed, of which a number can readily be inserted in any desirable location, as they conform exactly to the shape of the bricks. These ventilator bricks are sold at 50 cents and 75 cents each, according to execution.

Charles L. Cole, *Consul-General at Dresden.*

Glass bricks are not used in Hamburg for paving, but are occasionally utilized for building purposes, and with satisfactory results. In place of windows they are used to admit light in walls which, according to the police building regulations, are required to be fireproof and windowless. In addition to admitting light to dark hallways, rooms, etc., they possess the same strength as ordinary clay bricks. The hollow, so-called glass stones of the "Falconnier" system, which are made of blown glass in all colors and various shapes, are mostly used. They are also utilized in walls in yards and in partitions in the interior of houses, salesrooms, offices, workshops, etc., and for the construction of verandas, hothouses, kiosks, bathrooms, hospitals, ice factories, butcher shops, railroad stations, breweries, dairies, stables, factories, and in other localities where cleanliness, much light, and equable temperature are particularly desired. They are utilized in workshops where chemicals producing noxious vapors are manufactured or handled, and for insulating partition walls. The bricks are also manufactured with a wire coating for strictly fireproof walls.

These bricks are manufactured in Dresden, and the "Falconnier" glass building stones are manufactured by the Glashüttenwerke Adlerhütten Actiengesellschaft, at Penzig, Silesia. No glass bricks are manufactured in this consular district. Their use is still very limited and of little importance.

Hugh Pitcairn, *Consul-General at Hamburg.*

ITALY.

The use of paving bricks made of glass in Milan is limited to cover underground passages and for floor lights. In some recently erected buildings they have been adopted for ground and upper floors on account of the light obtained. They are also coming into use for partition work in some hospitals on hygienic principles.

These bricks, or so-called "tiles," are manufactured in Italy, but are also largely imported. Bricks from glass for building purposes are not manufactured in this district, but I have been informed that the "Societa di S. Gobain," at Pisa, an Italian branch of the well-known French company, has experimented in them, with what success I am not in a position to say. This company manufacturers the so-called "Dalles," which are also used for paving and roofing purposes.

Harlan W. Brush, *Consul at Milan.*

There is a glass factory in this city making paving bricks from glass in limited quantities; enough, however, to supply the demand. An official of the plant informed me that they use the same material as in the manufacture of heavy ordinary glass. The bricks produced are dark green and are used in paving places where light is desired in basements of business houses and other buildings. They are extensively used in modern buildings.

In one of the leading banking institutions of the city, of modern construction, the lobby office floor, which is about 36 by 58 feet, is entirely paved with glass bricks laid in iron frames for the purpose of admitting light into the basement where are numerous private boxes. The glass bricks used in this floor are light, of superior quality, imported from the La Gobain plant, France, and, I am informed, are made of material similar to that used in the production of fine plate glass. This firm has a subplant located at or near Pisa, Italy, for the superior material to be obtained in that region for the purpose.

Pietro Cuneo, *Consul at Turin.*

NETHERLANDS.

Paving bricks are not manufactured in the Netherlands. Of glass bricks sold Huinck & Imhofe, of this city, who are the sole representatives in the Netherlands for the manufacturers, refuse to give their names, and the dealers in building materials and the contractors and builders using the bricks know nothing of their origin. The bricks are made of pressed glass waste in various shapes, mostly square and oblong, are gray in color, exceedingly hard, and are not transparent. Huinck & Imhofe showed me samples of more than twenty kinds, some of them made in imitation of plaster ornaments. The demand for the bricks, while still limited, is growing. The plain bricks are used to advantage for paving bridges and vestibules of large public and office buildings, and also for wall coverings in chemical factories. As the bricks are insulating they will be used in the electric power houses now in course of construction for the electric street car companies of Rotterdam and The Hague. The ornamental bricks are principally destined for bridge decoration. Up to date, however, there has been no demand for these.

Blown-glass building bricks, hollow, and of octagonal shape, are used in the Netherlands to a limited extent. The only dealer handling them sells them in small lots of from 50 to 100. They are used principally for light-giving purposes in walls of machine shops and conservatories. The bricks are of a greenish color and transparent. The total consumption of these for Rotterdam and vicinity has been 14,000 during the last three years. The bricks have been for sale at Rotterdam for the last six years, but it took a long while before any demand was created.

S. Listoe, *Consul-General at Rotterdam.*

FIRE CLAY IN NOVA SCOTIA.

The manufacture of fire brick from native clay will be started on a large scale in Nova Scotia. At present large quantities are imported almost monthly by the large steel companies in Cape Breton, New Glasgow, and other industrial centers, the bricks coming mostly from England.

About a year ago a deposit of fire clay was struck in the Drummond colliery at Westville, owned by the Inter-colonial Coal Co. An experimental plant was installed and a test of the Drummond fire bricks has just been made at the steel plant at Sydney, and it is stated that the home-made brick served the purpose fully as well as the imported ones. Further test is to be made in one of the open-hearth furnaces, and hopes are high that a brick to stand any required heat can be produced at Westville. Often has the wish been expressed that there was fire clay in Nova Scotia suitable for making firebrick. It looks now as if the problem is about to be solved. It is the intention of the management of the Inter-colonial Coal Co. to erect two kilns of a capacity of 80,000 brick each per month. This will be the only plant east of Quebec.

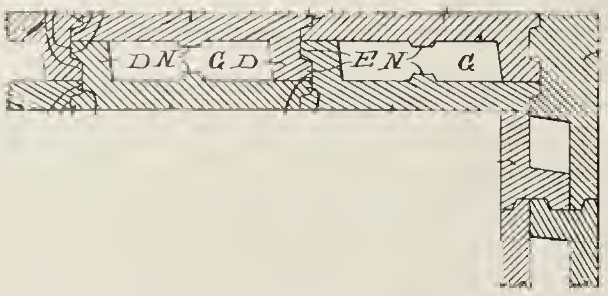
$21.35 TO ASBURY PARK, N. J.

and return, via Nickel Plate Road. Tickets good via New York City. Dates of sale, June 29th and 30th and July 1st and 2nd, with extreme return limit of August 31st, by depositing ticket. Chicago City Ticket Offices, 111 Adams St. and Auditorium Annex. Depot, La Salle and Van Buren Sts., on Elevated Loop.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

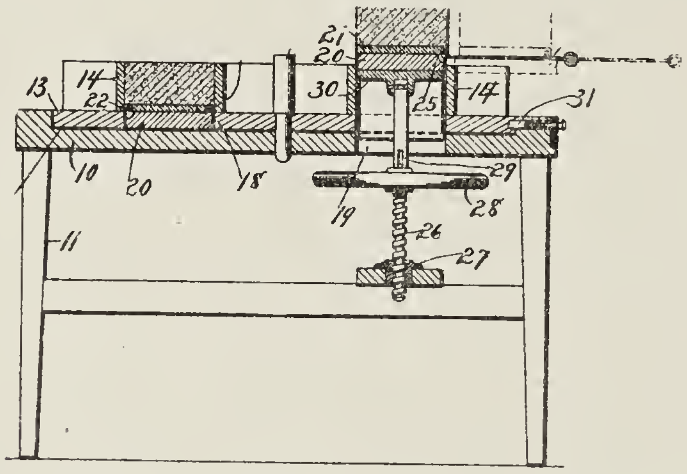
These new inventions are those that are especially of intest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

788,430. Interlocking Building-Block. Joseph Schall, Evergreen Park, Ill. Filed Oct. 31, 1904. Serial No. 230,826.



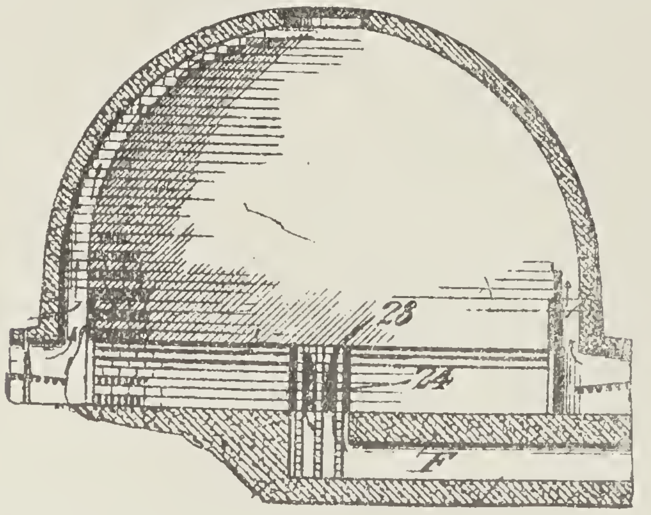
Claim.—An interlocking building-block provided at its ends with projections, said projections being disposed flush with opposite faces of said block, a flange at one end of said block oppositely disposed relatively to the projection at said end, and a projection at the free end of said flange parallel with the projection at said end.

790,044. Brick-Machine. Hunton B. Fisher, New Orleans, La., assignor of thirty-five one-hundredths to Frederick W. Sweet, New Orleans, La. Filed Aug. 2, 1904. Serial No. 219,183.



Claim.—In a brick-machine, a mold, a finishing-plate removably placed in the mold and movable vertically in said mold, the said finishing-plate having a perforation for receiving an extracting-tool, and a block on which said plate is placed, said block having a notch in line with the perforation in the plate.

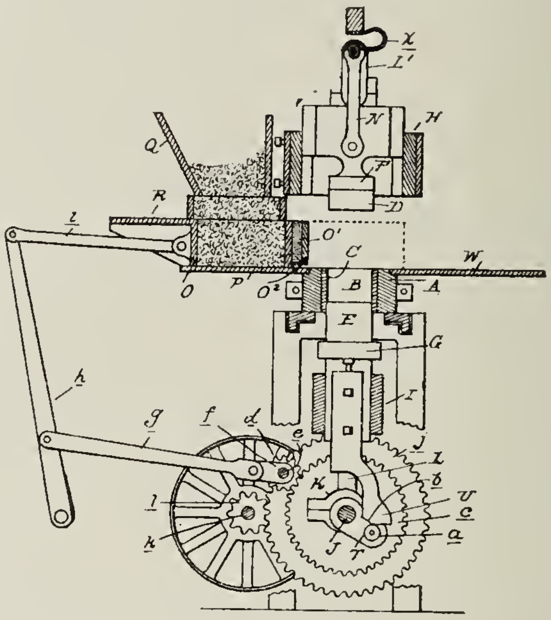
789,577. Brick-Kiln. Marcellus S. Storer, Nelson, Nebr. Filed Mar. 7, 1904. Serial No. 197,020.



Claim.—The combination with a kiln, of a stack external thereto, a tunnel leading to the stack and having an inlet-opening in the middle of the floor of the kiln, updraft and downdraft furnaces arranged alternately at the sides of the kiln, and channels connecting the furnaces with the tunnel.

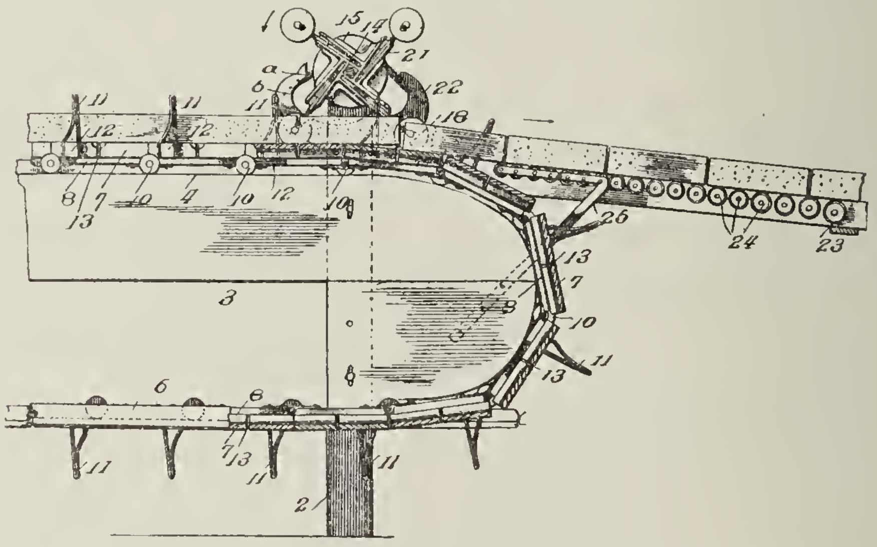
The combination with a kiln, of a stack external thereto, a channel beneath the floor of the kiln and leading to the stack, and having an inlet-opening at the middle of the floor, updraft and downdraft furnaces arranged alternately at the sides of the kiln, channels leading from the furnaces to the center of the kiln, and bag-walls disposed within the kiln in front of the dawndraft-furnaces.

789,129. Brick-Machine. Ebenezer W. Rider, Detroit, Mich. Filed Dec. 11, 1902. Renewed Oct. 7, 1904. Serial No. 227,604.



Claim.—In a machine for molding blocks, the combination with a bed having a mold-recess therein, of a rotary shaft, a pair of plungers adapted to compress the plastic material in said recess, means associated with the shaft for raising the upper plunger, means for raising the lower plunger, the upper face of the lower plunger being elevated to the plane of the top of the bed, said last-mentioned means including a rod operatively associated with the shaft and slidably mounted within a pivoted hollow cylindrical extension on the lower plunger, a receptacle for the plastic material supported upon said bed, and means for moving said receptacle into registration with said recess in the bed to first push away the compressed block, and to subsequently refill the mold-recess.

790,170. Brick, Block or Tile Cutter. Byron E. Bechtel, Waterloo, Canada. Filed Jan. 14, 1905. Serial No. 241,160.

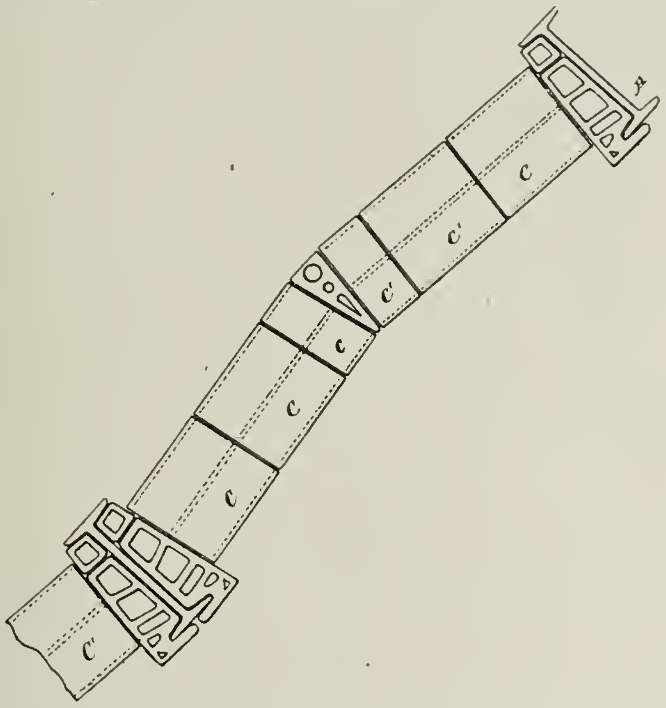


Claim.—In a cutting device, the combination of a traveling table with a cutting-reel actuated thereby and having guide-rollers, and cutting-wires arranged eccentrically with respect to the axes of the guide-rollers.

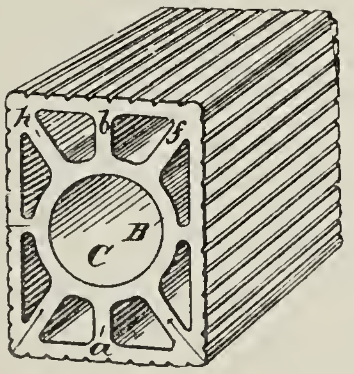
In a cutting mechanism, in combination, a cutting-reel comprising independently-movable frames provided with cutting-wires, a traveling table comprising sections having reel-operating standards, each section in length about equal to the distance between the cuts formed by said reel and between its ends formed to receive the cutting-wire, and tracks supporting said sections and inclined in rear of the point at which each cut is completed, whereby the sections assume a tilted position immediately after each cut is completed.

789,729. Hollow-Tile Arch. Henry L. Hinton, New York, N. Y. Filed Jan. 8, 1903. Serial No. 138,186.

Claim.—In an arch construction, the combination with the skewbacks each having a block-engaging face disposed at an angle to the vertical, and a key-block having converging block-engaging faces parallel to the angular faces of the skewbacks, of intermediate blocks having parallel end faces arranged end to end between the key-block and skewbacks, whereby said arch will support itself and its figured load without mortar or other binding material, substantially as described.

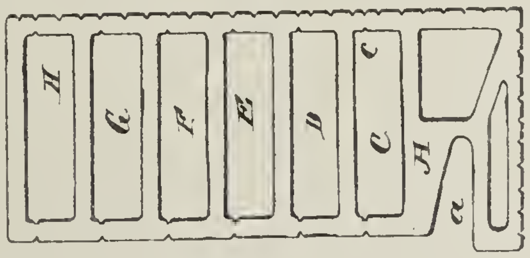


789,730. The Building-Block and Method of Forming Same. Henry L. Hinton, New York, N. Y. Filed Jan. 30, 1903. Renewed Dec. 6, 1904. Serial No. 235,745.



Claim.—The hereinbefore-described method of forming tile building-blocks, which consists in forcing the central part of the mass of clay outward from the center, by means of a central core, thereby forming a dense wall surrounding a relatively large central void, and connecting such wall with the outer wall of the tile at a plurality of points.

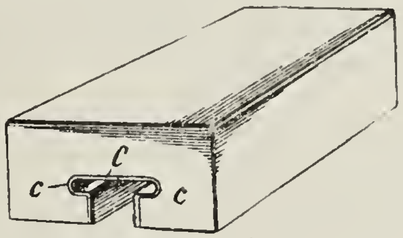
789,732. Tile Girder-Covering. Henry L. Hinton, New York, N. Y. Filed Jan. 31, 1903. Serial No. 141,249.



Claim.—A girder-covering tile provided with a plurality of permanently-removable frangible portions to enable the tile to be fitted to girders of varying depth, said tile comprising a hollow body, having its inner wall provided with a flange-receiving recess, and a plurality of transversely-extending weakened portions, arranged in different and parallel planes, and having an outer wall parallel to the inner wall and provided with a plurality of weakened portions extending transversely thereof and arranged in the same transverse planes as the weakened portions of the inner wall, and partitions connecting said walls between said weakened portions whereby a greater or lesser amount of the said body may be broken away and permanently removed to fit the tile to the girder with which it is to be used, substantially as described.

789,794. Undercut Tile. William H. Cammeyer, Boonton, N. J. Filed March 4, 1904. Serial No. 196,552.

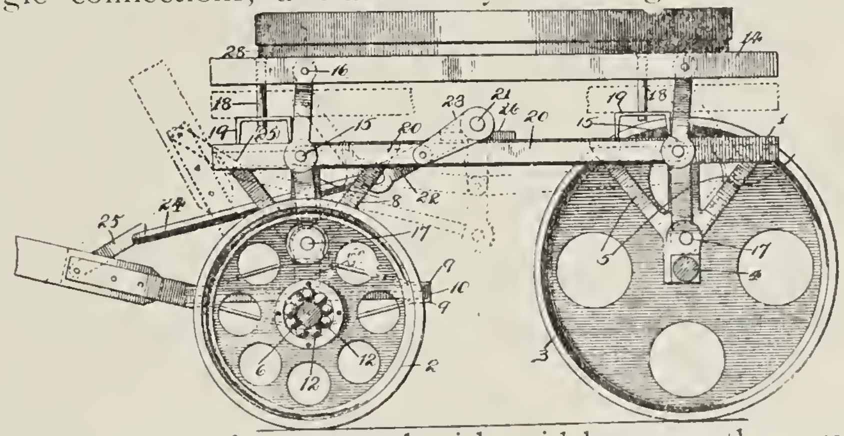
Claim.—A tile of suitable composition as described, having in its rear face, for engagement with a wall or the like, an undercut seat that carries a lining formed of a blank of different material.



A tile having in its rear face, for engagement with a wall or the like, an undercut seat that carries a lining formed of a metallic blank.

790,495. Truck for Handling Bricks. John J. Gledhill, Chicago, Ill. Filed April 6, 1903. Serial No. 151,212.

Claim.—A truck for handling brick, comprising a stationary body portion, front and rear wheels, an upper vertically-adjustable body portion, means for guiding the upper adjustable body portion in its up and down movements, a plurality of toggle connections arranged at opposite sides of the truck and adapted to connect the stationary body portion with the upper vertically-adjustable body portion, a plurality of longitudinally-extending bars for connecting the said toggle connections, a transversely-extending shaft, crank-arms on said shaft connected with said bars, another crank-arm on said shaft, a suitable tongue, and suitable connection between said tongue, and said last-mentioned crank-arm, the suitable devices being adapted to maintain the adjustable upper body portion in a horizontal position.



REORGANIZATION OF MONTAGUE & CO.

The Chattanooga Sewer Pipe and Fire Brick Company applied for a charter of incorporation in the office of the county register with $200,000 capital stock. The following are the incorporators: James Sloan, F. B. Sloan, H. B. Finley, D. P. Montague and Jas. M. Trimble. The object of the company is to reorganize the firm of Montague & Co., manufacturers of fire brick, tile, clay pipe and other articles from clay and earth. The company has one of the largest plants in the south, which is located west of Cameron hill, and also a large plant just south of Mountain Junction.

The company has made rapid strides within the past few years, and D. P. Montague, proprietor of the Chattanooga Clay Works and the Lookout Sewer Pipe Works, stated that it has become necessary to organize a stock company.

CLAY RECORD.
PUBLISHED SEMI-MONTHLY BY THE
CLAY RECORD PUBLISHING COMPANY,
Ninth Floor, Plymouth Building,
303 Dearborn Street,
CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.
Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVI. JUNE 15, 1905. No. 11

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

Lazy men are always harping on the luck of fools.

A successful man keeps his eyes and ears open and his mouth closed.

Don't pay any attention to boasting men and barking dogs. Neither of them will do you harm.

Cheer up—do not get discouraged, the last key on the bunch is often the one that unlocks the door.

The Clay Record is the only semi-monthly Clay Journal published in America. One dollar per year. Guaranteed largest circulation. Subscribe for it. Advertise in it. Results always.

During your busy days do not neglect to see that the fire pails are kept full of water and are in their place. Just a little water at the right time and place would save many a valuable piece of property.

That the business interests of this country are on a solid basis is plainly evident from the manner in which these interests have been maintained despite the revelations in finance and graft within recent weeks, but notwithstanding the strength exhibited we must say the reaction from these revelations is yet to come, and while we do not fear anything like panic conditions, we must sound a note of alarm that extreme caution must be exercised, and care taken so that whatever may happen the manufacturer or business man will not be taken unawares, he having previously protected himself against every possible contingency. This is not the time for wildcat speculation, nor for reckless investment, but the time to rid one of inflated stocks and questionable bonds, and increasing bank balances.

The world at large has heaved a sigh of relief over recent reports that it is more than likely that the nations which have been at war will come to some understanding and terminate the conflict which has been raging in the far east for now more than one year, waged at a great outlay of men and treasure.

It is becoming more difficult every day to find reasons justifying two or more nations to wage war with one another. Ex-Senator Lamar in his oration at the McKinley memorial meeting said, "If we know each other we will love one another." This truth has been spreading through the world rapidly in recent years, and today the civilized world stands aghast at the terrible war that has been waging, and there exists today a sentiment so strong and so widespread that we doubt very much whether a similar war will be waged in many years to come, if ever be waged between civilized nations.

The people of all nations are awaking to the sentiment that they are on the earth to engage in the pursuit of health, happiness and prosperity; that the most deadly foe to these is war. They are also awaking to the fact that the evil practices of nations must cease, among the rest that of "earth hunger;" that each nation must concede to every other the same rights and privileges that each regard as essential to its own best and highest good.

With all the losses of men and treasure the recent war has taught the world a needed lesson, and one which could not have been taught in any other way, perhaps, and may we hope that the nations shall hereafter and forever dwell in peace.

Accidents will happen. This remark has become a sort of superstition with many, evolving into a belief that regardless of what may be done, accidents will happen; that no matter what may be done a given number of accidents may be expected, and we have become strongly of the opinion that this view of the matter is really responsible for the numerous accidents we are called upon to chronicle, at least, a great many of them, and is based on a study of the reports of these accidents. In this issue there is given a number of accidents treated briefly because of limited space, but in reading the details in original reports we are safe in saying that nine-tenths of these accidents might have been averted if common sense and common prudence and foresight had been exercised.

While urging our readers to give more attention to providing for the comfort and safety of those engaged about their plants as a duty they owe to their employes as well as it being a moral obligation resting upon them to do so, we must also impress them with the increasing growth of public opinion in the direction of investing owners and employers with legal responsibilities for accidents coupled with indemnities, and these latter no small sums, either, as recent judgments rendered amply prove. It becomes the owner of a yard to study every possible thing that will safeguard every station where an accident might happen as it will prove a good investment for every dollar spent in surrounding with protecting devices every dangerous point in and around his plant.

ACCIDENTS, DAMAGES AND LOSSES.

Edward West, who was hurt while working in the clay banks of the Coshocton (O.) Brick Company, has commenced suit for $10,000 damages.

At the Chicago Hydraulic Pressed Brick Company's plant at Porter, Ind., Theodore Anderson, the foreman, fell off a ladder into a drive wheel and was crushed to death.

August Dissov was so burned by the explosion of an oil can at one of the plants of the Illinois Brick Company that he died after being taken to the Alexian Brothers Hospital.

J. O. Johnson was killed by a dirt car running over him at the works of the South Knoxville (Tenn.) Brick Company, and his administrator is now suing for $10,000 damages.

H. C. Moeller, an employe of the Bradshaw Brick & Tile Company, Ft. Dodge, Iowa, had his hand drawn into a tile machine, crushing it so badly that it was necessary to amputate it.

For the death of Wm. J. Perry, the administratrix has brought suit for $10,000 damages against the Sargent Brick Company, Painesville, O. Perry was buried beneath falling clay which he had been excavating.

James Remey has received a judgment for $1,100 against the Peebles Paving Brick Company, Portsmouth, O. Remey was injured by a "runaway clay car" jumping the track. Arch Thompson, another employe, was granted $150.

While washing a large belt at the plant of the National Brick Manufacturing and Construction Company, Omaha, Neb., Charles Townsend was caught and hurled with fearful force against the engine. His chances for recovery are slim.

The overloading of a blast at the plant of the J. M. Rumbaugh Brick Company, at Pitcairn, Pa., seriously injured four workmen and wrecked a portion of the plant. Later J. M. Rumbaugh applied for a receiver and the Safe Deposit and Trust Company of Pittsburg are in charge. The company's liabilities are $102,000.

FIRE! FIRE!! FIRE!!!

The factory of the Western Fire Brick Company, Granite City, Ill., has been destroyed by fire. The company will rebuild.

Fire destroyed the roofs over the large kilns of the Cape Girardeau (Mo.) Press Brick Company, causing a loss of $2,000.

The Roseville (O.) Brick & Terra Cotta Company suffered a loss by fire started in the dryer. The loss is $1,000, fully insured.

The Enterprise Brick Company, Kingshighway and Tyler Ave., St. Louis, Mo., suffered a loss of $2,500 by fire. Insurance unknown.

The plant of the Winkle Terra Cotta Company, Manchester and Pierce Aves., St. Louis, Mo., was partly destroyed by fire, causing a loss of $400,000. Six of the large buildings were burned to the ground.

NATIONAL ASSOCIATION WILL HOLD ANNUAL MEET IN BUFFALO.

The Brotherhood of Operative Potters of America will meet in this city in annual convention during the week of July 10. The local body is making extensive preparations for the entertainment of the delegates. A trip to the Falls, a trolley ride around the city and a banquet are among the features of the entertainment.

National President T. J. Duffy of East Liverpool, Ohio, was in Buffalo recently and made arrangements for the coming convention. Headquarters will be established at the Vendome Hotel. The executive board and the auditing committee of the order will meet in Buffalo during the last week of June and will remain in session at the Vendome Hotel until the end of the convention.

The local arrangements are in charge of Robert C. Gaston, and a committee selected from the lodge as follows: Harry Mackin, B. M. Bell, Charles Strausser and Harry Finney.

FOURTH OF JULY

Tickets will be sold at one fare for the round trip, plus twenty-five cents, from Chicago, July 1st, 2nd, 3rd and 4th, to any point on the Nickel Plate Road. Return limit July 5th. Chicago Depot, La Salle and Van Buren Sts. City Ticket offices, 111 Adams St. and Auditorium Annex. Telephones Central 2057 and 6172 and Harrison 2208.

$14.00 TO CHAUTAUQUA LAKE, N. Y.

and return, from Chicago, via Nickel Plate Road, July 7th, with extreme return limit of August 8th, by depositing ticket. No excess fare charged on any train on the Nickel Plate Road. Cheap rates to other eastern points. Three trains daily, with vestibuled sleeping cars. Individual Club Meals, ranging in price from 35c to $1.00, served in Nickel Plate dining-cars; also service a la carte, and Mid-day Luncheon, 50c. Write John Y. Calahan, General Agent, 113 Adams St., Room 298, Chicago, Ill., for particulars. Chicago city ticket offices, 111 Adams St. and Auditorium Annex. Chicago Depot, La Salle and Van Buren Sts., on the Elevated Railroad Loop.

WOULD SUPPRESS CITY BRICKYARDS.

A vigorous fight is being made by the members of the Real Estate Exchange against the brickyards of Denver. There is no legal way of getting rid of those already established, it is said, but the exchange is doing everything in its power to prevent the establishment of any more yards within the confines of the city.

With this idea in view the brick yard committee of the exchange was present at a meeting of the state land board. The committee is composed of George F. Van Law, chairman; F. J. Chamberlain and A. J. Fowler.

The board had up for consideration an application from the brickyard owners north of the park to be permitted to grade some school land abutting on Twenty-sixth avenue, and use the clay for making brick. The owners already have a contract with the city by which they are grading Twenty-sixth avenue, and as the school land is adjacent they wished to make a similar contract with the state. The strip owned by the state is fifty feet wide and 4,800 feet long, and lies directly north of the avenue.

The committee told the board that it was very desirous of getting rid of all brickyards within the city limits. That a brickyard made all adjacent property undesirable and unprofitable, and was a detriment to the real estate interests of the city; that the exchange was particularly anxious that no more yards be established in Denver, and that the committee was now laboring with the city authorities to endeavor to get them to cancel the contract which the East Side brickmakers had for grading the street.

No conclusion was reached by the board, as the committee asked for a week's time in order to confer further with the city authorities.

RECEIVER FOR BRICK CO.

The Safe Deposit & Trust Co. has been appointed receiver of the J. M. Rumbaught Brick Co., Pittsburg, Pa., with authority to take possession of the property of the company and perform such other duties as the court may order from time to time.

A petition was presented by Attorney John S. Cox for J. M. Rumbaught, president, and J. S. Rumbaught, secretary of the company, who set forth that it was incorporated July 12, 1892; that it owns land in Mt. Pleasant township, Westmoreland county, consisting of 35 acres and a plant for the manufacture of brick, a similar business at Irwin, where eight acres are owned, and a similar business at Pitcairn, where the concern owns 10 acres around its plant; that the principal office is in Pittsburg; that the corporation is indebted to the amount of $102,000, $75,000 of which is secured by mortgage on the real estate, and the mortgages are liable to be foreclosed.

It is asserted that owing to the business depression for some time past it was especially brought about by fire destroying the company's three plants. It is unable to pay its debts, and judgment aggregating $25,000 has been entered against it. It is asserted that the company is in good condition if it has a little time to straighten up its obligations, but unless a receiver is appointed to look after its affairs all its property will be sacrificed.

AMERICAN ENCAUSTIC TILE WORKS INCREASING ITS ORDERS TO OLD WORLD MARTS.

As evidence of the fact that the products of Zanesville, Ohio, manufactories are sold in all the marts of the world, a large consignment of tile from the American Encaustic Tile works was placed aboard 19 Wheeling & Lake Erie cars, and is booked to firms in Sydney, Australia, and Auckland, New Zealand, thousands of miles away.

This mammoth order was received some time ago and the plant has been busy getting out the tile for some weeks. The sight of 19 cars waiting on the company's side-tracks for the product was an unusual one, from the large number of cars, and also from the fact that the destination is in the antipodes.

The Wheeling & Lake Erie road will carry the tile to Hoboken, N. J., and at that place it will be put on board steamers for its journey of many thousands of miles.

The American company is constantly receiving orders from European marts, but it has extended its scope during the past few years so that other countries are numbered among its customers. The fine grade of tile manufactured by the concern is in great demand in foreign countries and these form the major portion of its business.

The orders of the firm has increased business to such an extent that only this spring it was found necessary to prepare plans for a $50,000 new addition. The bids have been let and the construction of the new addition will be begun this summer, and brought to completion as rapidly as possible.

OMAHA BUILDERS NEED BRICK.

Building operations are now beginning in good shape and it will not be long, so contractors say, until a good supply of building brick will be available. Building material prices range about the same as last year, with the exception of brick. It is expected that as soon as some of the big kilns are opened the price of building brick will decline. Every brick yard in South Omaha and vicinity is behind in its orders. Lumber dealers look for a good season and with anything like good runs at the stock yards the packers will soon be compelled to put on additional help. Some business men think that with a good year the losses incurred by the packing house strike last summer can be made up and that before winter sets in South Omaha will be one of the best cities in the country again.

$12.25 TO BUFFALO, N. Y.

and return, via Nickel Plate Road, from Chicago, July 8th, 9th and 10th, with extreme return limit of August 4th, by depositing ticket. Stopover allowed at Chautauqua Lake points. Also lowest rates to Ft. Wayne, Cleveland, Erie and other eastern points. Three trains daily, with first-class equipment. Meals served in Nickel Plate dining-cars, on American Club Meal Plan, ranging in price from 35c to $1.00; also service a la carte. No excess fare charged on any train on the Nickel Plate Road. If contemplating an eastern trip, write John Y. Calahan, General Agent, 113 Adams St., Room 298, Chicago, Ill. Chicago Depot, corner Van Buren and La Salle Sts., the only passenger station in Chicago on the Elevated Railroad Loop.

CHANGES THE NAME OF THE COMPANY.

Articles of incorporation were filed by the Terre Haute (Ind.) Vitrified Brick Company. The company was formerly known as the Terre Haute Brick and Pipe Company. The incorporation is made with a capital stock of $125,000, and the purpose of the company is the manufacture of brick, sewer pipe and hollow building blocks, and incidentally to dig coal and bore for oil. The location of the company's plant is in Sugar Creek township. W. R. McKeen, Anton Mayer, Albert Z. Foster, Charles Minshall, John Kennedy, D. Russ Wood and William P. Blair are named as directors of the company for the first year.

BUSINESS RUSHING WITH C. O. BARTLETT & SNOW CO.

The C. O. Bartlett & Snow Co., Cleveland, Ohio, report business very brisk, in fact, they are getting more business than they can well attend to. Some of their recent sales:

Rockefeller Bldg., Cleveland, O., ash and cinder elevator.

Ohio Retarder Co., Port Clinton, O., Triumph steam dryer.

Western Ore Separating Co., Salt Lake City, Utah, direct heat rotary dryer.

Henrietta Cyanide & Dev. Co., Henrietta, Ariz., direct heat rotary dryer.

Grasselli Chemical Co., Cleveland, O., large conveying outfit.

Standard Oil Co., Cleveland, O., conveying outfit.

Iroquois Portland Cement Co., Caledonia, N. Y., two direct heat rotary dryers.

National Mining Co., Pittsburg, Pa., large conveying outfit with capacity of 175 tons of coal per hour.

I. E. Boomer, Detroit, Mich., Triumph sand and gravel digger, elevator and grader for elevating and grading 40 yards per hour.

Royal Crown Lead Co., Detroit, Mich., paint machinery.

Wm. Allerdice & Son, Saratoga Springs, N. Y., fertilizer dryer.

C. Schmidt & Co., Cincinnati, O., fertilizer dryer.

Croninger Packing Co., Shamokin, Pa., fertilizer dryer.

Glidden Varnish Co., Cleveland, O., paint machinery.

Shoab Paint Co., Wellsville, O., paint machinery.

Cameron & Barkely, Charleston, S. C., conveying and elevating machinery.

Sandusky Portland Cement Co., Sandusky, O., No. 3 direct heat rotary dryer for drying 10 tons of crushed rock per hour.

E. H. Alverd, Marble Mount, Wash., paint machinery.

Ross Keller Tripple Pressure Brick Machine Co., St. Louis, Mo., crushing, conveying and sand mixing machinery.

Hudson Portland Cement Co., Hudson, N. Y., Portland cement machinery.

Bellville Portland Cement Co., Bellville, Ont., Portland cement machinery.

Crescent Portland Cement Co., Wampum, Pa., feeders and Portland cement machinery.

Brighton Chemical Co., New Brighton, Pa., elevating and mixing machinery.

American Iron and Steel Co., Lebanon, Pa., coal conveyors.

Guignard Brick Works, Columbia, S. C., sand and clay dryers.

Besides many other small orders, which are coming in rapidly from all sections of the country.

They are also receiving quite a number of inquiries from foreign countries.

BAMBERGERS ARE IN CLAY WORKS MERGER.

Ernest and J. E. Bamberger of Salt Lake, Utah, are interested in the proposed merger of the big clay plants of the Denny Clay Company and the Renton Clay Company, both located between Tacoma and Seattle, Wash. The Bambergers, together with other stockholders of the Renton Clay works, have taken an option on the plant of the Denny Clay Company, which has six weeks yet to run. Their associates include Moritz Thomsen, millionaire flour manufacturer, and Peter Larson, the Montana railroad contractor.

If the option is taken up it is proposed to combine the plants under one management, thereby obtaining control of the Northwestern business in clay products.

The Denny Clay works is doing a very large business, supplying Tacoma and Seattle with vitrified brick for paving, pressed building brick, tiling drain pipe, and sewer pipe. The Renton Clay works has recently installed new machinery and the Denny Clay Company is building an entire new plant at Taylor.

Bamberger Bros. have made money in the clay-working business in Utah, thereby appreciating the splendid business opportunity which a monopoly in the Northwest will give them.

SHIP CLAY TO ENGLAND.

Mr. Charles Le Compt, contractor, was in Flatonia, Texas, a short while on his way to Galveston, where he goes to arrange for the transportation of 5,000 tons of Texas white clay to be shipped to Liverpool, England. Mr. Le Compt is connected with Efros Bros., Limited, of Amsterdam, Holland, and New York, and has been in the vicinity for several months, and the deposits of white clay at Lena, Fayette County, and Maurin, Gonzales County, on the San Antonio & Aransas Pass Railway, have been thoroughly tested and are pronounced inexhaustible. In fact, centuries may be consumed in mining the product. Efros Bros., Limited, are operating clay mines in Cromwell, England, and Conception Bay, Newfoundland, at present. Lately they developed Texas fields, opening mines of the Mexican Gulf Company and Atlanta Efrosite Company.

The mines at Lena are near the Katy Railroad and no doubt the Holland stockholders of the road are interested largely in the valuable deposits.

LEGAL FIGHT FOR PROFITS FROM A TILE ROOFING PATENT.

A. B. Klay, who brought his patents for the manufacture of tile roofing to Lima, O., from Ottawa, and formed the Klay Tile Roofing Company, alleges in a suit in Common Pleas Court that he has been duped by his colleagues. He says he also placed a number of brick and clay-making machines into the plant, and was to have had a good salary as manager, and a one-third interest in the business. Instead, he says, he has received nothing, though the company has made money from the start. Mr. Klay is a German and the trial is protracted because of his testimony. Attorneys Bailey & Bailey, of Ottawa, are conducting the case for the plaintiff, who seeks a dissolution and money judgment.

SAND OR LIME-BRICK OR BLOCK NEWS.

The Owensboro (Ky.) Sand Lime Brick Company is now ready for actual work.

The Astoria (Oregon) Fuel & Supply Company are now making sand-cement brick.

Will E. Cochran, Paducah, Ky., is erecting buildings from sand brick manufactured by himself. Later he expects to manufacture brick for the market.

Lemley & Holby, New Holland, O., have bought a concrete brick machine and will engage in the manufacture of concrete brick along with blocks.

Richard Latham of Lincoln and two Chicago gentlemen will start a Portland cement and sand brick plant at Pekin, Ill.

The South Bend (Ind.) Cement Brick Machine Company is a newly organized industry. D. McHenry is the president, C. L. Millhouse, secretary, and H. H. Hutson general manager.

The National Cement Pressed Brick Company, St. Barnard, Ohio, has been incorporated with $100,000 capital stock. Incorporators are J. W., J. C. and Stanley Smith, C. A. Anderson and Frank E. Stevenson.

The first brick to be turned out by the Waterloo (Iowa) Sand Lime Brick Company is going through the process. The company has orders on hand to keep the plant running all summer.

The sand lime brick made by the Fremont (O.) Sand Lime Brick Company in a recent test stood 1,960 pounds per square inch, and a two months' old test 2,100 pounds. The test further states that frost has no effect on the brick.

The Schenectady (N. Y.) Brick Co. has been incorporated, with $100,000 capital stock. Directors are Edgar T. Brackett, Saratoga; H. V. Borst, Amsterdam, and Daniel Naylor, Jr., Schenectady.

J. C. Kundinger, formerly of the Sebewaing plant, now superintendent of the Flint (Mich.) Sandstone Brick Company, has reconstructed the machinery of the same and is now making 15,000 brick daily.

The Indianapolis (Ind.) Composite Brick Co. has been incorporated with $60,000 capital stock. Directors are: Lawrence Elkus, Louis Morgan, Conrad Bender, B. V. Perry, Carl S. Griswold, R. M. Seeds and Chas. S. Symons.

The Diefendorf Hydraulic Pressed Brick Process Company, Griswold and George Sts., Binghamton, N. Y., have started the construction of their factory. O. G. Diefendorf is the inventor of the process.

The New York Granite Brick Company has been incorporated with $300,000 capital stock under New Jersey laws. The incorporators are: Wm. B. Parsons, 60 Wall St.; St. John Clark, Hackensack, N. J.; John A. Wilber, 279 Pearl St.; F. A. Crandall, 144 Liberty St.; Donald Ross, 1123 Broadway.

◆◆◆

The Tripoli (Ia.) Industrial Association are offering inducements for a brick and tile yard to be located there.

MISCELLANEOUS ITEMS.

Grant & Jennings have bought the Diagonal (Iowa) Brick & Tile Co.'s plant and have opened up the yard.

The Columbus (O.) Hocking Coal Co. will spend $1,000,000 to engage in the clay business.

The Aurora (Ill.) Brick & Tile Co., owned by Alderman Curry, is being dismantled and the machinery sold.

The Birnamwood (Wis.) Brick Co. have all their machinery in place, so they can begin active work at once.

I. G. Holdridge and H. Babb, of Gridley, Ill., are at Corwith, Iowa, with a view of establishing a tile plant there.

Rockwell Bros. have leased the Lexington (Ill.) Brick & Tile Works and will operate same.

S. G. Monroe, of Butte, Mont., has purchased ground at Twin Bridges, Mont., and will begin at once to install a brickmaking plant.

M. L. Case has bought a half interest in the Bluff City Brick Co., Pine Bluff, Ark., from J. W. O'Neal. The company will make several improvements.

Geo. H. Lewis, of Bluffton, O., has disposed of his interest in the Ashley (Mich.) Brick Works to his partner, Albert E. Fuller.

The Dallas Pressed Brick Co., Mesquite, Texas, has been incorporated, with $30,000 capital stock. Incorporators: W. O. Conner, S. B. Marshall, and R. S. Kimbrough.

M. C. White and L. C. Farnum, of Pawnee, Ill., have bought the brick and tile factory at Mt. Auburn, and Mr. Farnum will remove to Auburn to assume the management.

The Harbison-Walker Refractories Co., Pittsburg, Pa., is erecting at Mt. Union, Pa., the largest fire-brick manufactory in the world.

The brick and tile factory at Kellogg, Ia., has been bought by Mr. Crews, of Lynnville, and is being worked by him at present.

John E. Barens, Logansport, Ind., has resigned the presidency of the Contractors' Association and sold his brick yard, and will retire from active business.

A meeting has been held in the office of Haas & Spears, Alvin, Texas, looking to the organization of a pressed-brick company to control a large body of fire clay.

Fraser-Johnson Brick Co., Emory, Texas, has been incorporated, with $50,000 capital stock. Incorporators are W. P. Johnson, T. S. Foster and W. B. Fraser.

The Miles City (Mont.) Lumber Co. have leased the Bullard Brick Works and have commenced the manufacture of brick.

The McAlester (I. T.) Brick Co. has been incorporated, with $50,000 capital stock. The officers are: William Busby, president; E. W. Schreiner, vice-president and general manager; R. H. Busby, secretary, and J. E. Rohrer, treasurer.

The Brazil (Ind.) Clay & Mining Co. has been incorporated, with $50,000 capital stock. Gustave Stievenart will be the general manager. The company has 75 acres of clay land.

The Hoosier Supply & Brick Co., Indianapolis, Ind., has been incorporated, with $10,000 capital stock.

It is reported that Dallas, Iowa, will soon have a brick and tile factory.

The Bach Brick Co., Montrose and California Ave., Chicago, have bought 17 acres of land, paying $26,000 for same.

E. E. Meyer has puchased the Crescent City (Ill.) Brick & Tile works.

The Straitsville Impervious Brick Co., New Straitsville, O., has been incorporated in Arizona with $50,000 capital stock. T. C. Moulding is interested.

The Chicago Retort & Fire Brick Co. are making improvements to their Brickton plant at Ottawa, Ill. New kilns and additional machinery are being put in.

J. F. Maymyer has bought the B. G. Petterson Brick works at Comanche, I. T., and will move there and operate same.

Isaac Gates has purchased the brick and tile factory at Edgewood, Iowa, from Morris Mellon and is now running same.

The Leavenworth (Kas.) Brick plant owned by the Pittsburg Paving & Building Brick Co., has been sold and the new owners have taken possession of the property.

The Territorial Penitentiary at Santa Fe, N. Mex., has received a Dry Press brick machine and are now turning out brick.

The Nelson Vitrified Brick Co., Mound Valley, Kan., has been incorporated, with $50,000 capital stock. Frank M. Gilmore is president; August Nelson, vice-president; S. M. Stotts, secretary, and A. L. Driggs, treasurer.

The Sibley-Menge Press Brick Co., Birmingham, Ala., has been incorporated, with $100,000 capital stock, by J. W. Sibley, J. A. Menge, J. T. Collins, Jr., W. L. Sibley, J. H. Menge, Jr., and B. H. Menge.

S. T. Fleshman, mayor of Center, Shelby Co., Texas, and C. D. Thompson, of Nacogdoches, have started a brick manufacturing plant at the latter place; 5,000,000 brick per annum will be made.

The Covington (Va.) Brick Co. has been organized for the purpose of manufacturing red clay, stiff mud brick, capital $25,000. C. W. Rush will be the manager. They are in the market for all kinds of machinery and supplies.

The Sioux Rapids (Ia.) Brick & Tile works operated by Messrs. Tymeson, Mills and Freelove, are now turning out tile and are considering adding machinery to make hollow blocks and tile above 12 inches.

The Verona (Miss.) Brick & Tile Mfg. Co. has been organized with $10,000 capital stock. The incorporators are leading business men. F. M. Clark is president; F. A. Green, vice president; J. A. Orr, secretary and treasurer, and W. H. Sharp, manager.

Montague & Co., Chattanooga, Tenn., has sold the Lookout Sewer Pipe works and the Chattanooga Clay works, whose plants are located at foot of Gillespie St., and near Blowing Springs, Ga., to the Chattanooga Sewer Pipe Fire Brick Co.

The Mason City (Ia.) Brick & Tile Co. have started up for the first time their new sewer pipe plant.

John Bliss is having a sample kiln of brick made at Alta, Ill., and if successful a plant will be started.

A new brick yard has been started at Winn, Mich. Lee Taylor is the moving spirit in the venture.

The Minter City (Miss.) Tile & Brick works has been incorporated with $50,000 capital stock by S. C. Cowgill, E. M. Streator and others.

The Sterling Pressed Brick Co., whose plant at Hillsboro, Ind., has been idle for several years, is being thoroughly overhauled and will be put in operation.

The Terra Haute (Ind.) Vitrified Brick Co. has been incorporated with $125,000 capital stock. They will take over the plant of the Terra Haute Brick & Pipe Co.

The Delta (Colo.) Brick & Tile Co. has been incorporated with $5,000 capital stock by W. F. Hornsby, W. R. Johnson and J. H. English.

The DeWitt (Ia.) Brick & Tile Co. have filed articles of incorporation with $10,000 capital stock. The directors are J. G. McKinney, Wm. S. McKinney and Ida S. McKinney.

The Butler Brick works, Houston, Tex., has been incorporated with $50,000 capital stock by M. Butler and John F. Butler of Austin, and M. K. Sachs of Houston.

The Inter-colonial Coal Co., Westville, Nova Scotia, will build a fire-brick plant making 80,000 brick per month. This is the first fire-brick plant in Nova Scotia.

The Alvin (Tex.) Pressed Brick Co. has been incorporated with $10,000 capital stock. F. A. Haas is one of the directors.

The Diana Brick & Tile Co., at Loeb, 8 miles south of Beaumont, Texas., has sold 3,000,000 brick for use by the government on the Panama canal.

The Enterprise Brick & Tile Co., Baltimore, Md., has been incorporated with $50,000 capital stock. Incorporators are A. J. Wise, F. D. Cooke and H. Arnold.

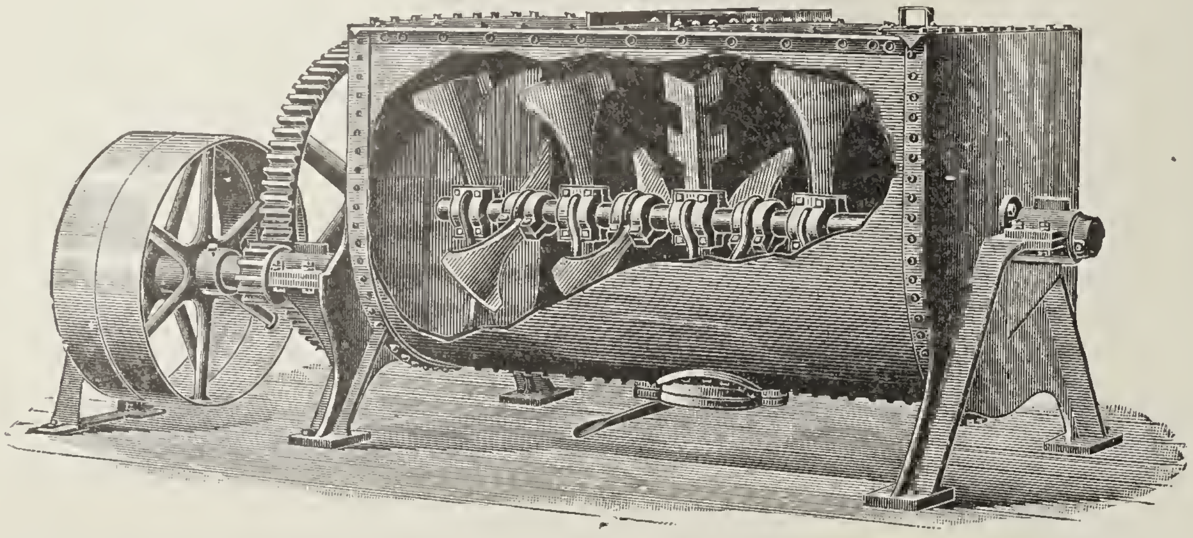
The Brazil Clay & Mining Co. has been obliged to change its name to the Progressive Mining Co. on account of similarity of wares.

The Palmer Brick Co., Atlanta, Ga., has just bought a tract of land fronting the Louisville & Nashville and Southern Railways, and will leese same for factory sites and furnish power from their own electric plant which is to be installed.

The Veedersburg (Ind.) Clay Co. has been reorganized by Clint Marshall being elected president, and Walter Marshall, secretary and treasurer. The plant will be reopened as soon as possible.

The Jersey Paving Corporation, 45 Clinton St., Newark, N. J., has been incorporated with $100,000 capital stock by Wm. G. Coates and John C. Lyons of Newark, and Thomas Conyington, of Montclair, N. J.

The Willard (Ky.) Clay Co. officers has formed the Willard Fire Brick Co., and will erect a fire brick plant at that place. The stockholders are Ed. Haney, Robert Jordan and Perry Henderson of Olive Hill, Ky., and L. D. Carlson of Portsmouth, Ohio.



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Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

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A good established brick yard, in a city of 40,000 inhabitants, in Illinois. Plenty of clay, and can sell all the brick that can be manufactured. Good reason for selling. For particulars, address

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Brick and tile plant. Stiff Mud. Continuous kilns. Steam dryer. Good clay and excellent market.

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One J. D. Fate A Special Auger Machine, 40,000 brick per day. In first class working order.

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20,000 fine pallets. $30.00 per thousand, F. O. B. cars here.

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For sale, reasonable, in condition—
One 5x18 foot Horizontal Tubular Boiler.
One No. 20A Penfield Hollow Brick Machine.
One 14 foot Pug Mill.
One Disintegrator.
One 40 foot Clay Conveyor, with 20 foot belt.
Forty Fire-proofing Dies, with two extensions, pullys, clutches and belting.
Reasons for sale, are making different ware.

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FOR SALE.

For sale—An up to-date brickyard, land and all machinery, at Buchanan, Mich, on the Michigan Central Railway. Can be run by steam or electricity. Owing to the fact that it is owned by a woman who is unable to run it, it can be sold at a bargain.

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A 20,000 capacity brick and tile plant, located in good Michigan town. Has Stewart patent kilns, plenty of drying sheds, all machinery in good condition, fine clay, good market, established business. Price very reasonable. Address

MICHIGAN,
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Machinery For Sale.

FOR SALE.

50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets Track gauge 25 inches.
Both styles of cars in first-class repair.

ATLAS CAR & MFG. CO.
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A second-hand No. 2 Giant Auger Brick Machine. Address "GIANT,"
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One Steam Power Soft Mud Brick Machine.
15,000 feet of one-inch Pipe.
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25,000 Pallets and Racks for same for outside drying.
Three Transfer Cars.
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Four-Mold Dry Press, absolutely as good as new. made only one kiln of brick. Can sell for less than half original price. Address

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One Conical Smooth Roll Crusher No. 25, Style "F," manufactured by American Clay Machinery Co., Bucyrus, O. One No. 5 board delivery side-cut Brick Table. This table has never been used. For information, write

STRAIGHT BROS.
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WANTED.

A brick and tile plant in exchange for a good Iowa or Illinois farm. Address

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WANTED.

An experienced brick and tile man to superintend a number of brick plants. One who can make a financial investment preferred. Address

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Do Your Brick Turn White?

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Carbonate K.B. C.F.H. **of Barytes**

The only preventative for scum and discoloration on facing Brick and Terra Cotta; neutralizing the Sulphate of Lime in the Clay and Water.

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A second-hand three-mold Andrus Press, in good condition. Prefer only Andrus type, as I am already using one on my yard. In naming price give length of time used and present condition.

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WANTED.

To buy or lease a brick plant. Must be situated in Pennsylvania, Ohio, West Virginia, Kentucky, Indiana, Michigan or Illinois, and have shale or fire clay raw material.

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FOR SALE.

Drain Tile and Brick Plant for sale. Good machinery. Good location. Plenty of clay. Price $2300, small payment down, long time on rest. Wil take product as pay. Address

CONTINENTAL,
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One No. 4 Double Mold Brick Repress, made by The American Clay Working Machinery Co. Price $125.00.

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$25 **FOR SALE.** Enquire about our combination offer. Patent Brick and Tile Kiln and Patent Grateless Furnace. 40 per cent fuel saving. Next best thing to continuous kiln.

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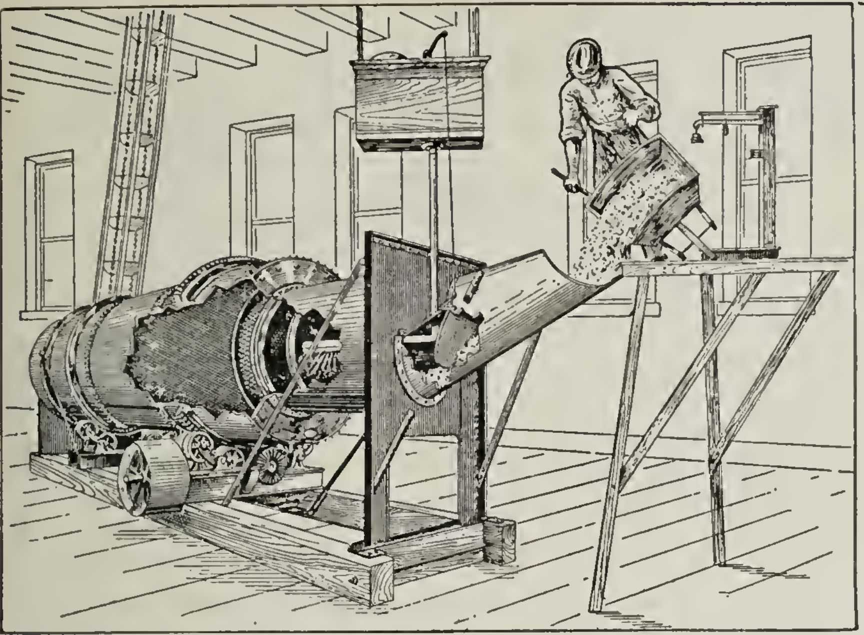

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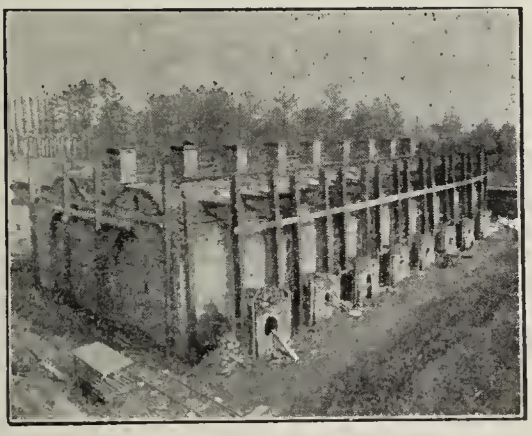

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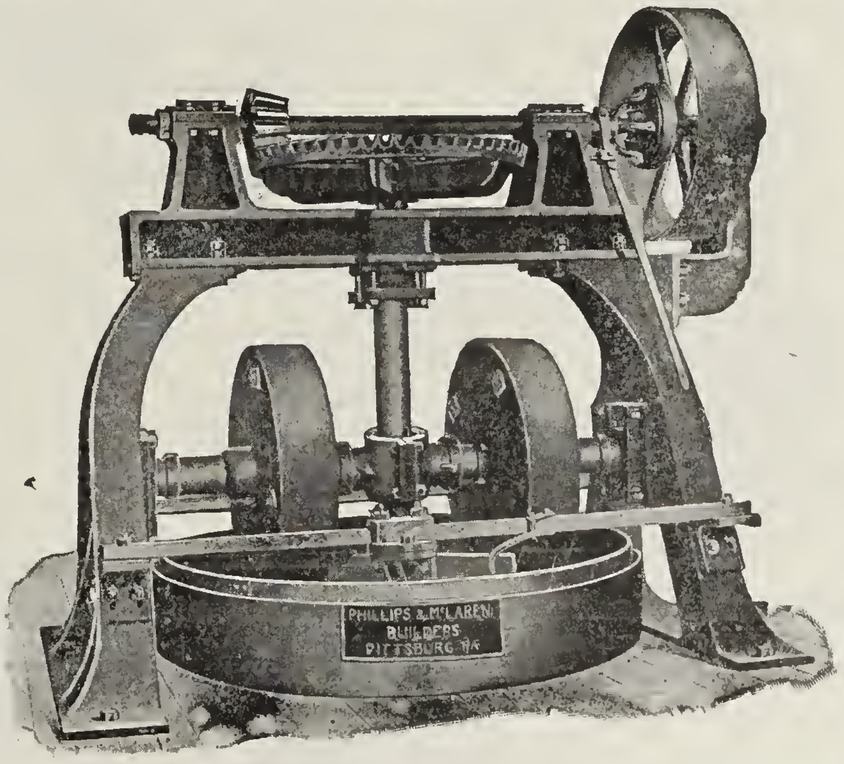

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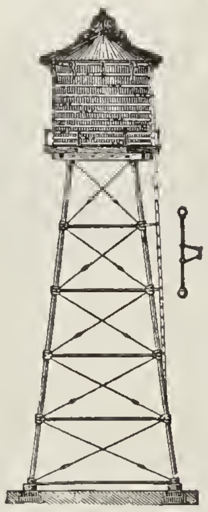

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is safe, staunch and durable and will carry four times the weight of the filled tank. Expensive labor is not necessary to erect these outfits, your own men can do it. We furnigh all plans.

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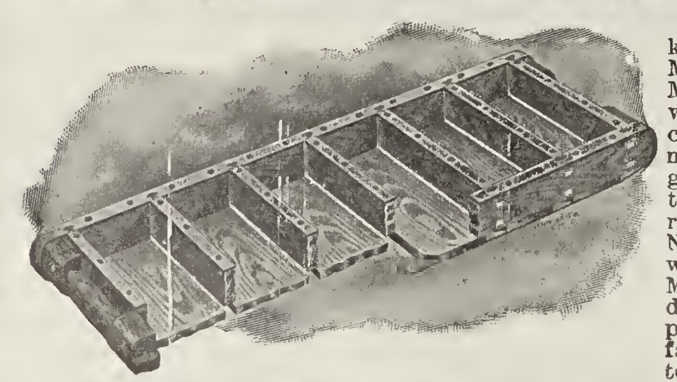
PERFECTION BRICK MOULDS



These are the kind of Brick Moulds the Brick Makers have always wanted but could not get till now. You can get a mould that the vents are right all the time No change whether the Mould is wet or dry. Try a sample order. Satisfaction guaranteed.

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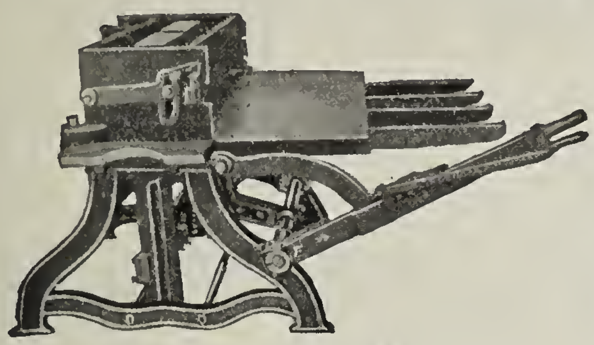

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Get equipped with a Normandin and don't be handicapped, as this machine is complete and practical. Hundreds in use, thousands of Normandin Blocks used daily. Cheaper and better than brick or stone. The U. S. Government engineers, and the leading engineers, contractors, builders, cement workers and railroads have adopted and are useing the Normandin because it's right and superior to all others. **Investigate.** Normandin Blocks are in demand. Their manufacture is a permanent and profitable business.

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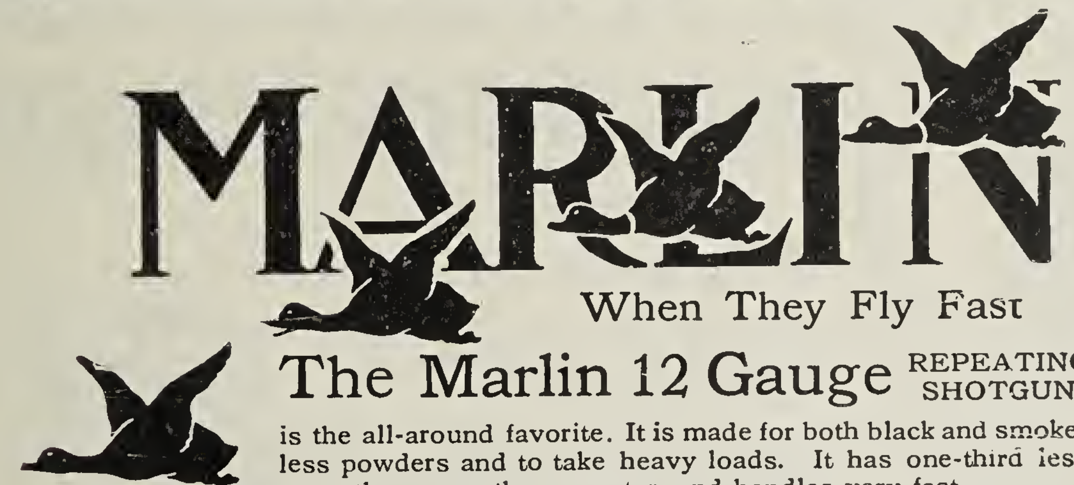

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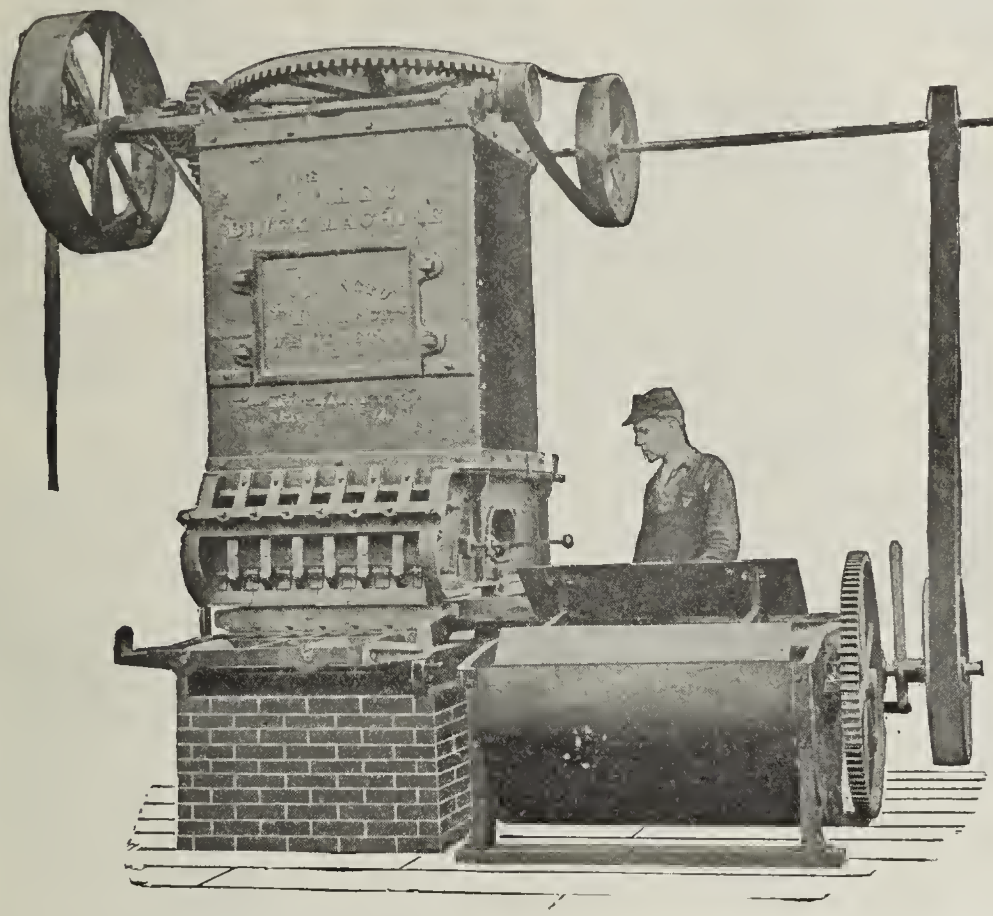

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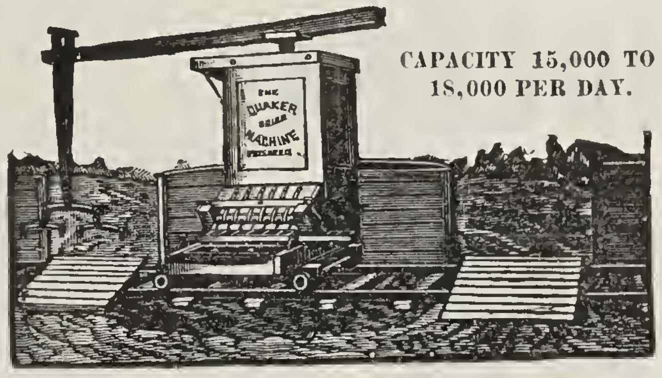

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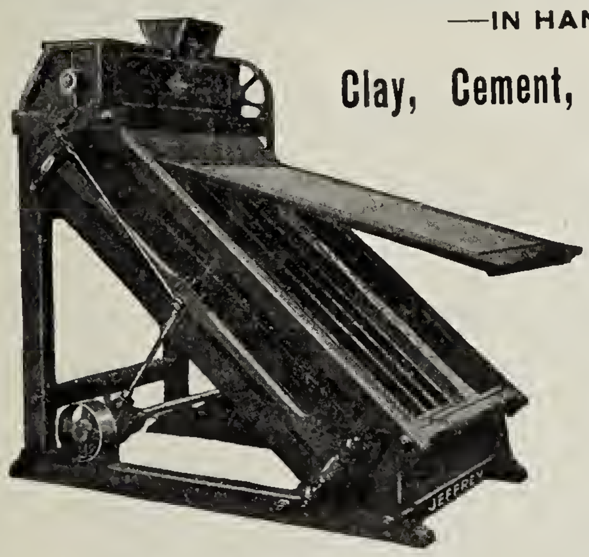

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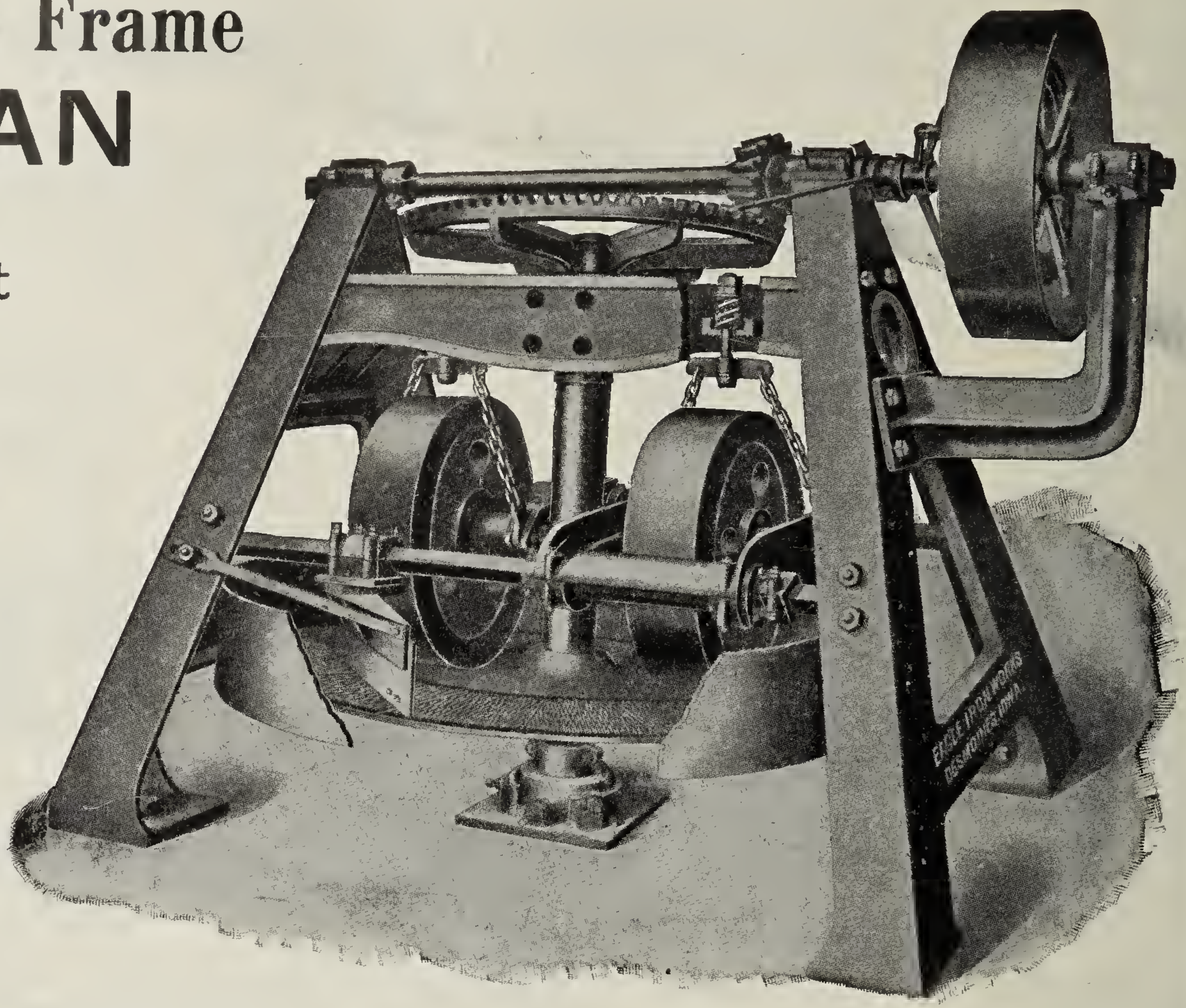

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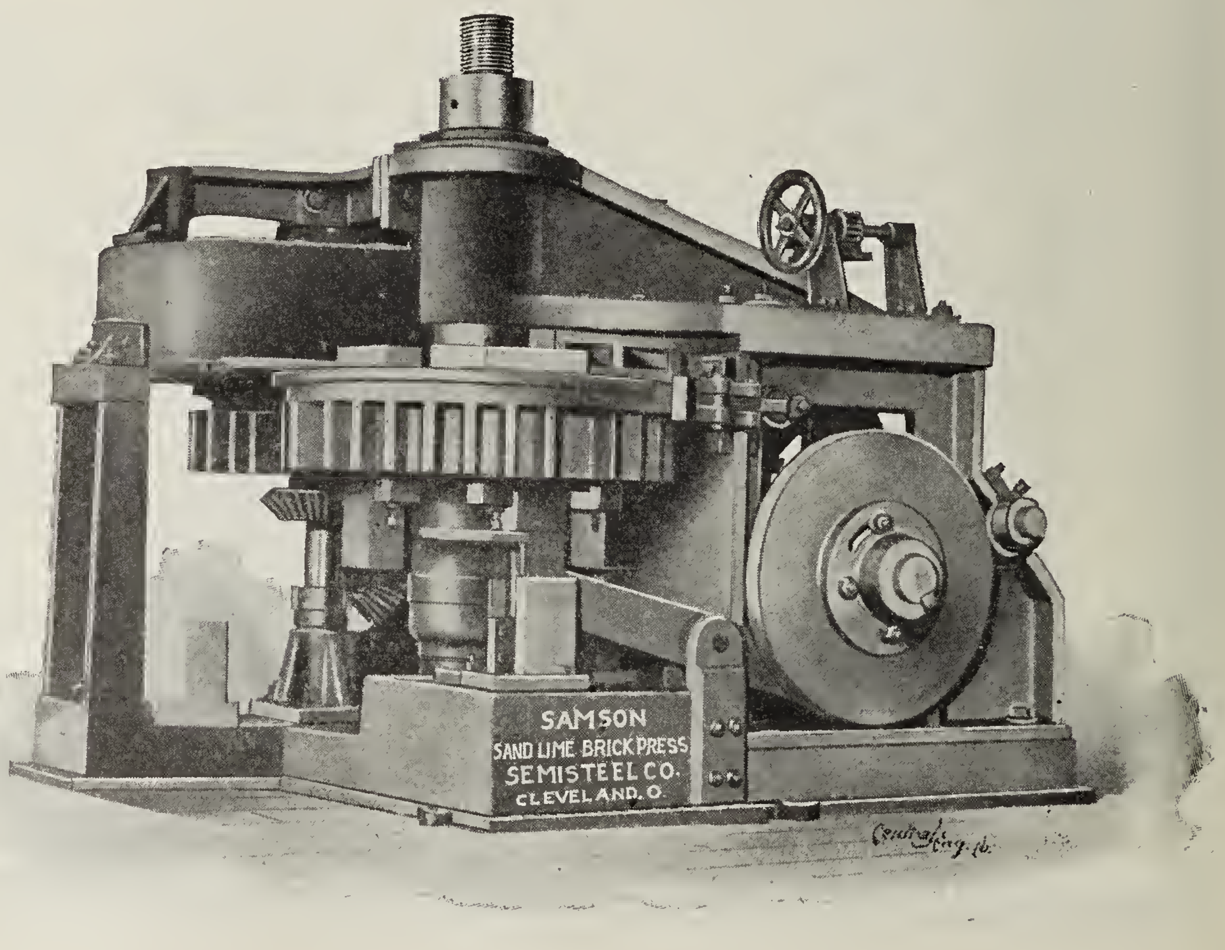

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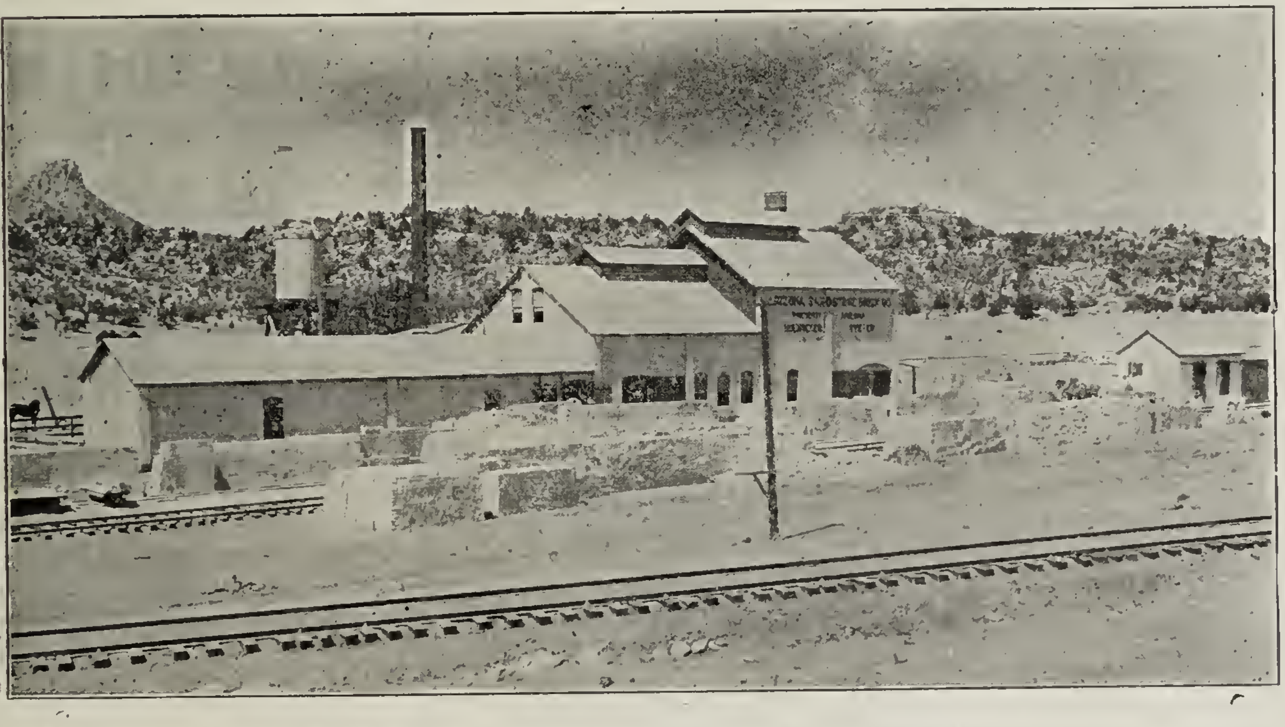

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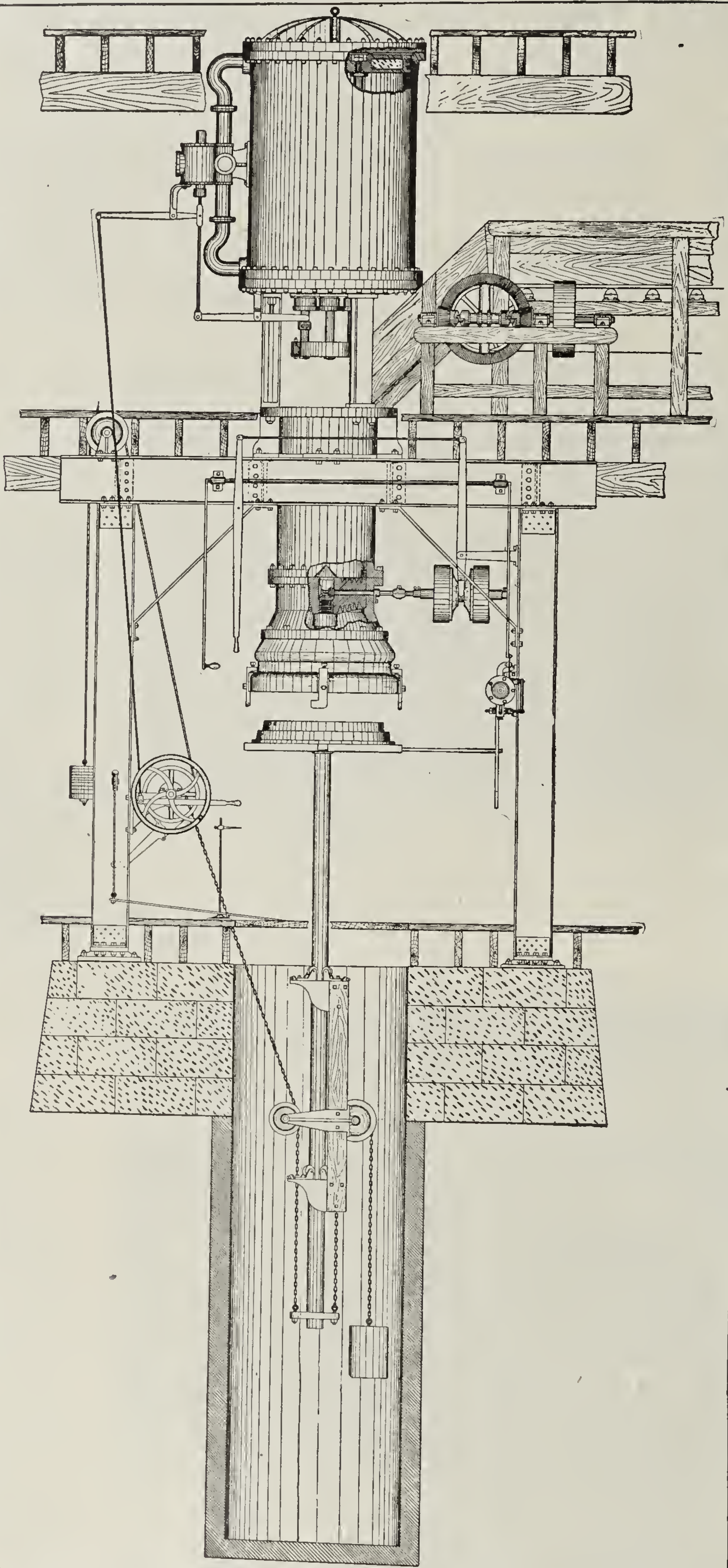

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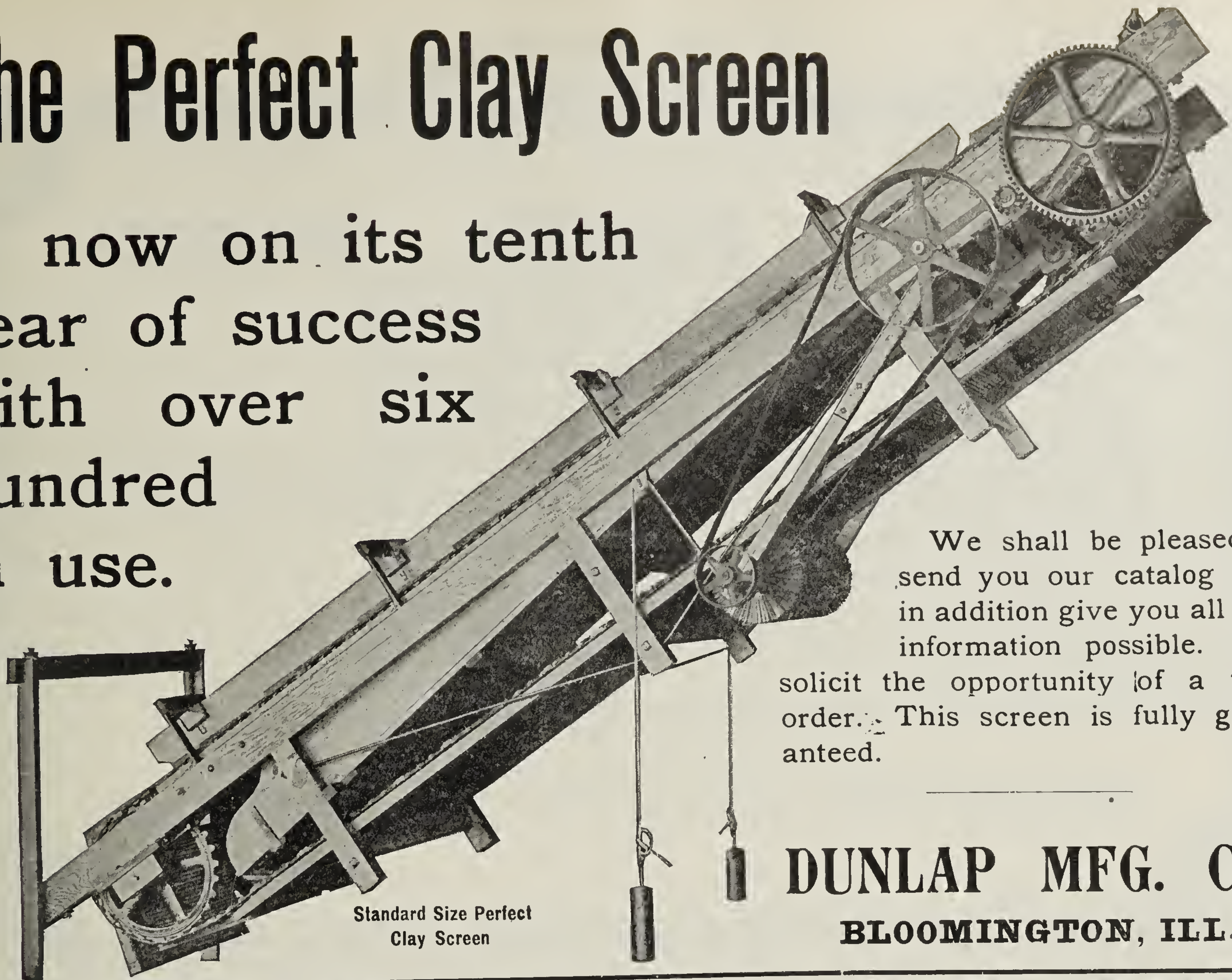

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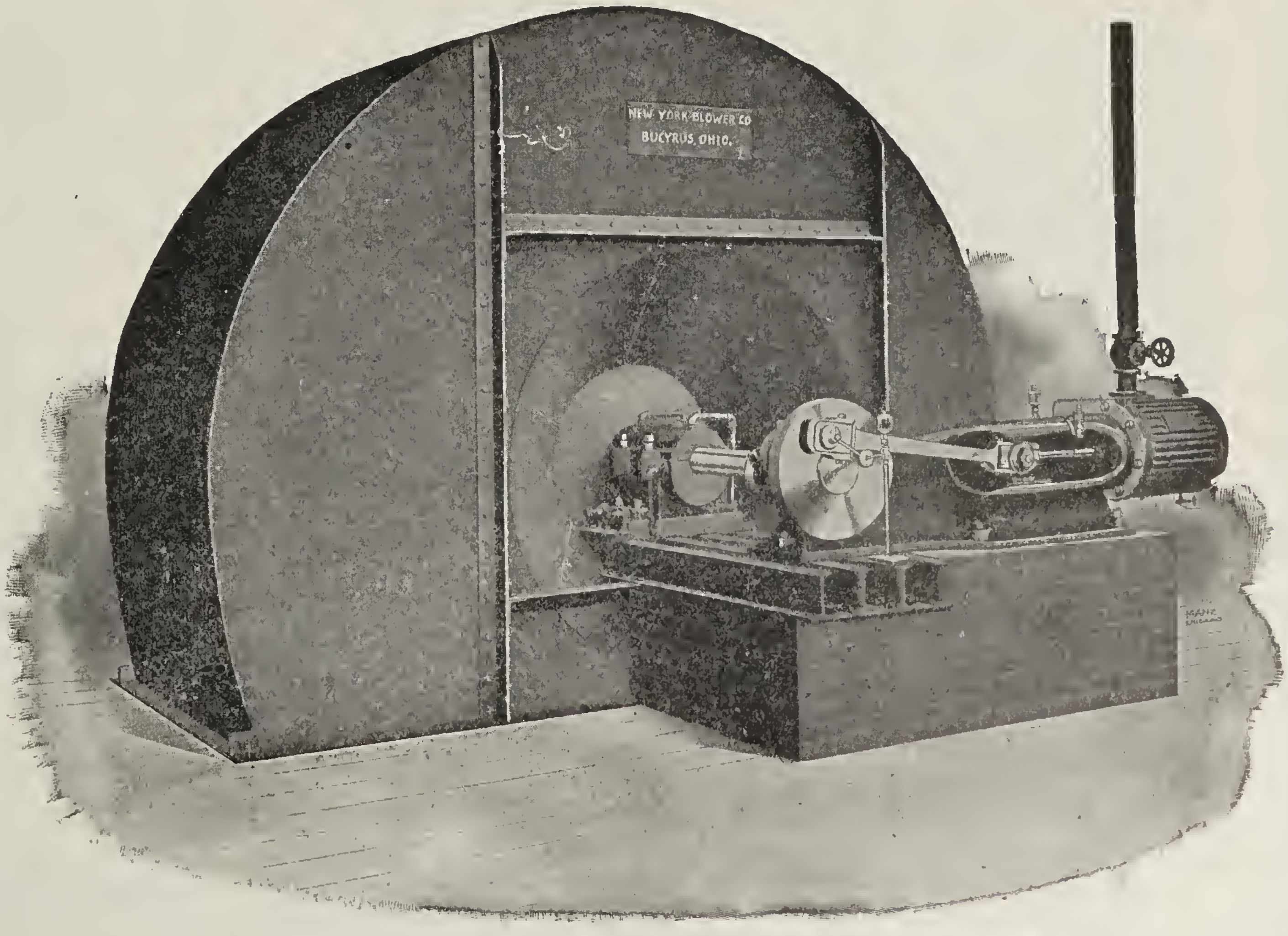

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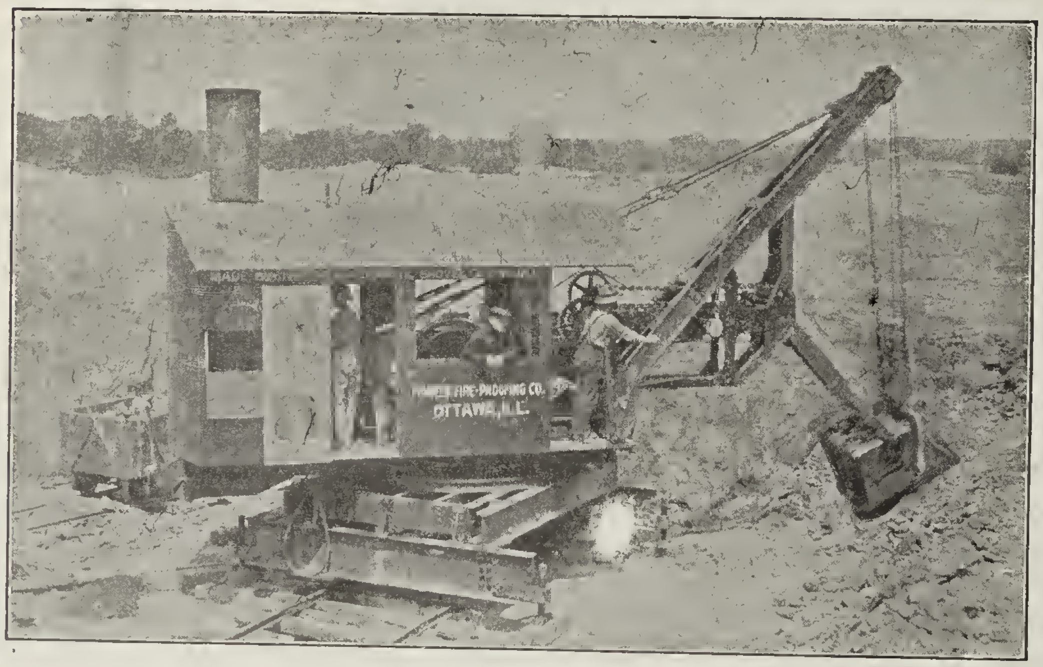

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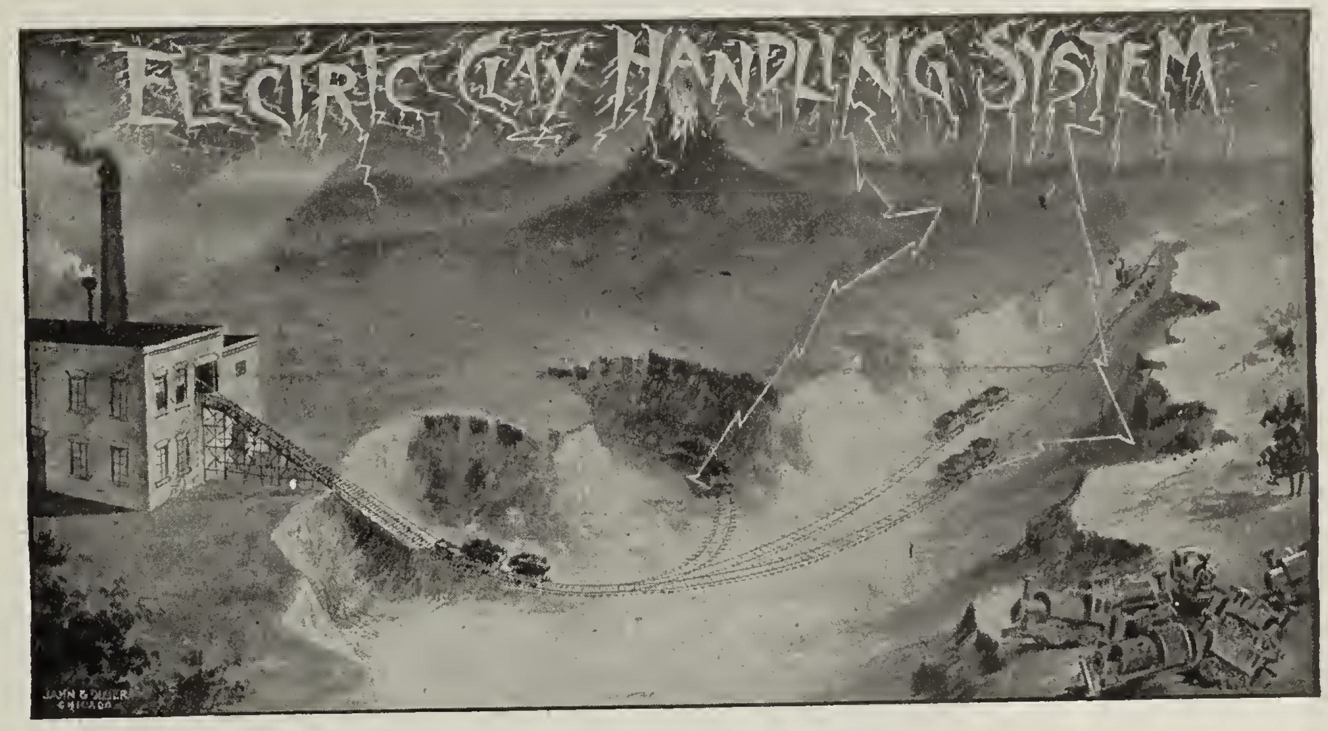

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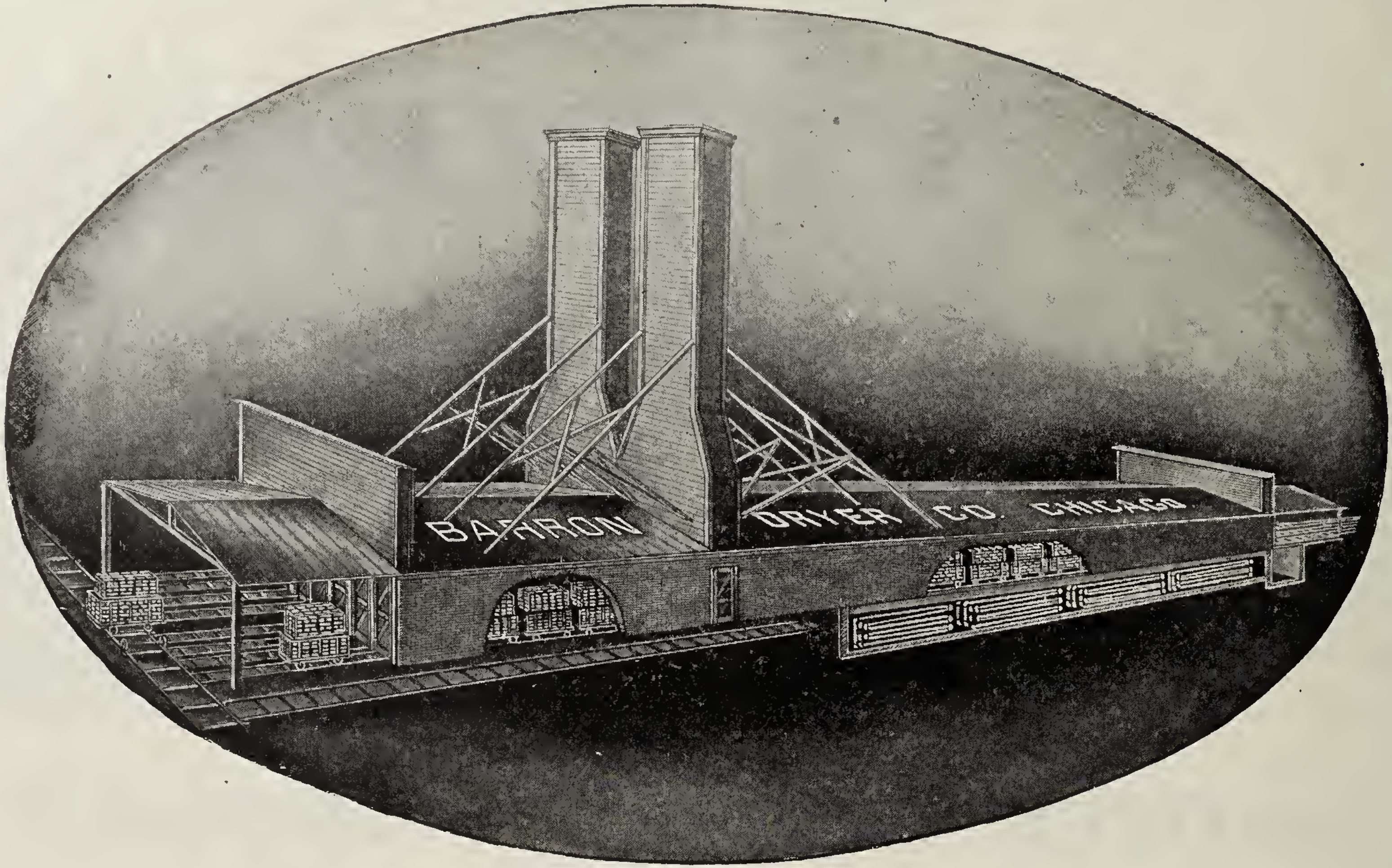

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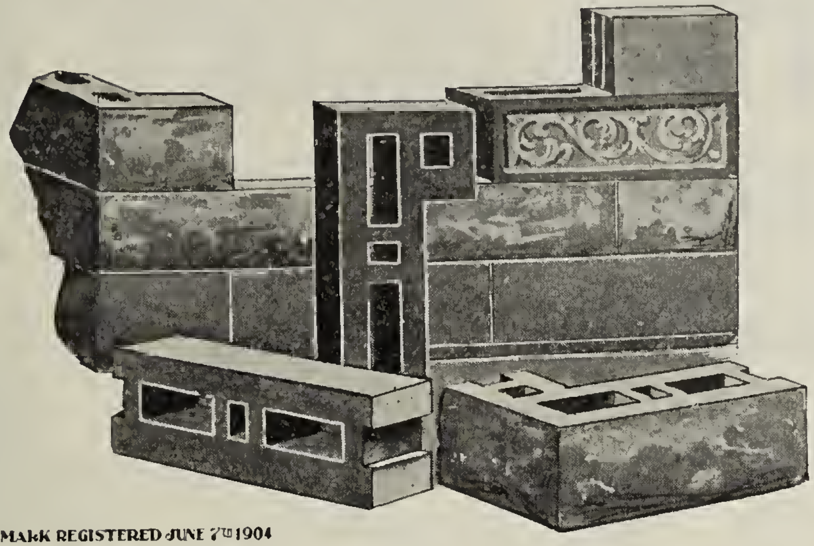

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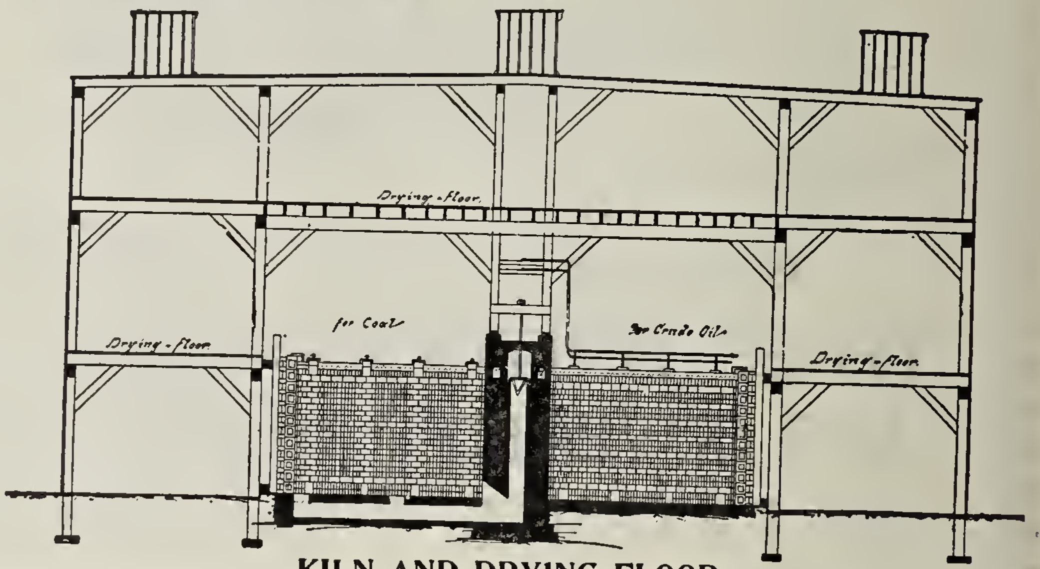

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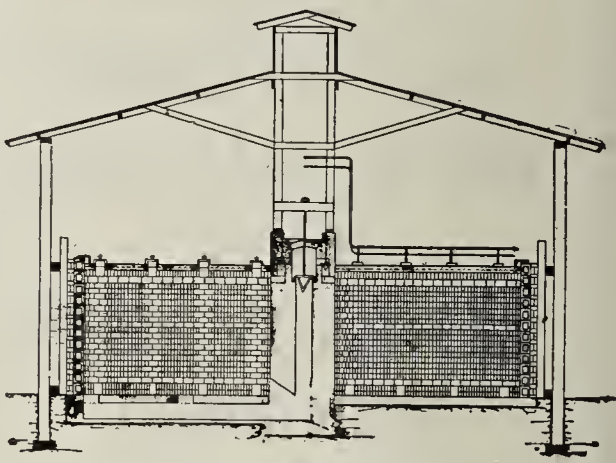

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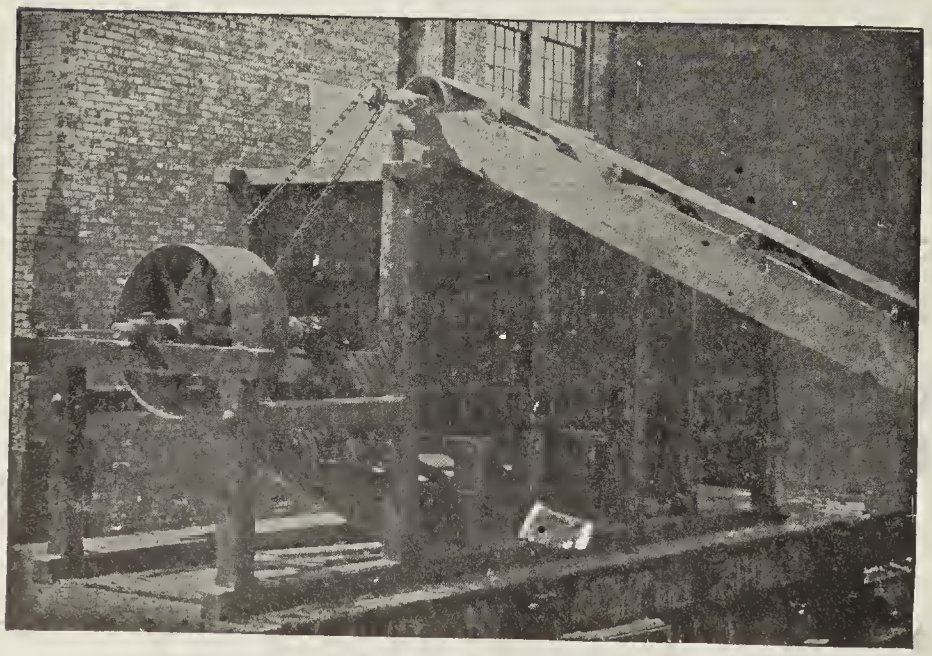

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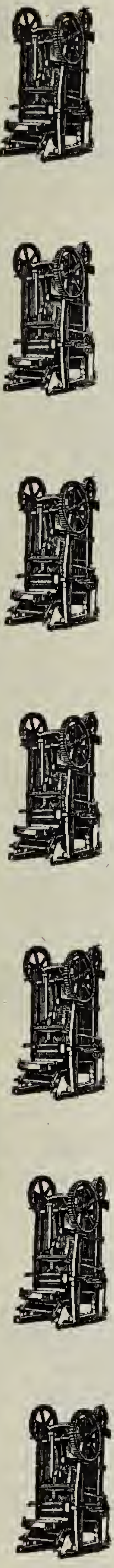
Consulting Clay-Worker Engineers,
163 Rhine Street, Chicago, Ill.



MARTIN

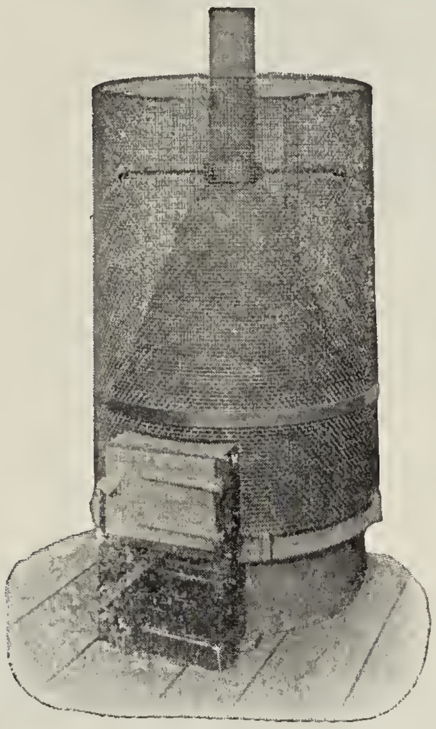
LANCASTER, PA., U. S. A.

DON'T

Forget that we design and equip complete **BRICK PLANTS** to make good brick. Those with square corners and edges and smooth faces.

POINTS

To consider in buying machinery are Construction, Adaptability, Results, Cost.



OUR

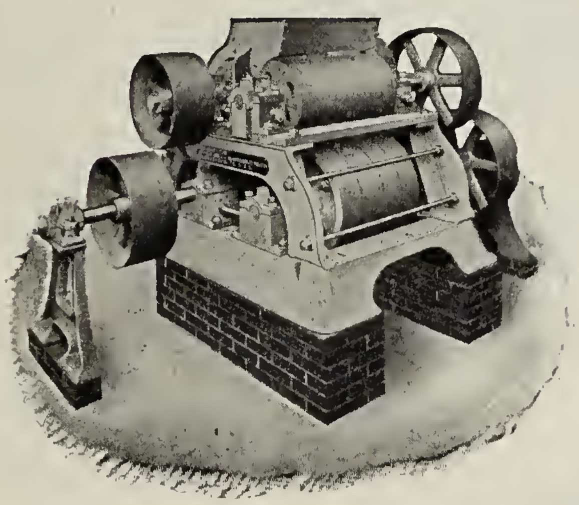
SAND DRYER is a **BRICK-YARD NECESSITY.** Simply start the fiire and the Dryer does the rest.

DO

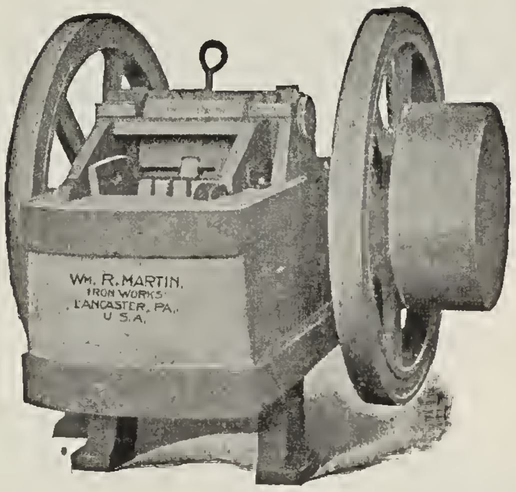
You need any **CRUSHING MACHINERY** about your plant?

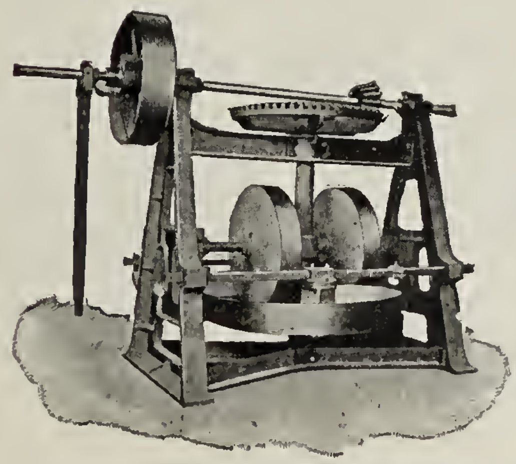
IF

So, ask us to send you our new catalog R. just from the printer.

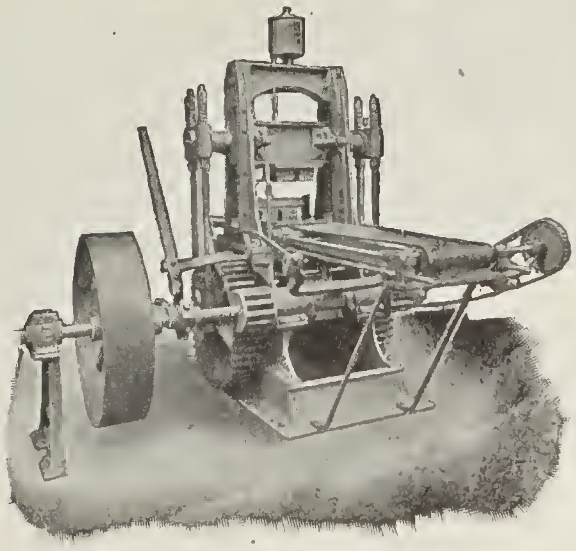


WE GUARANTEE SATISFACTION

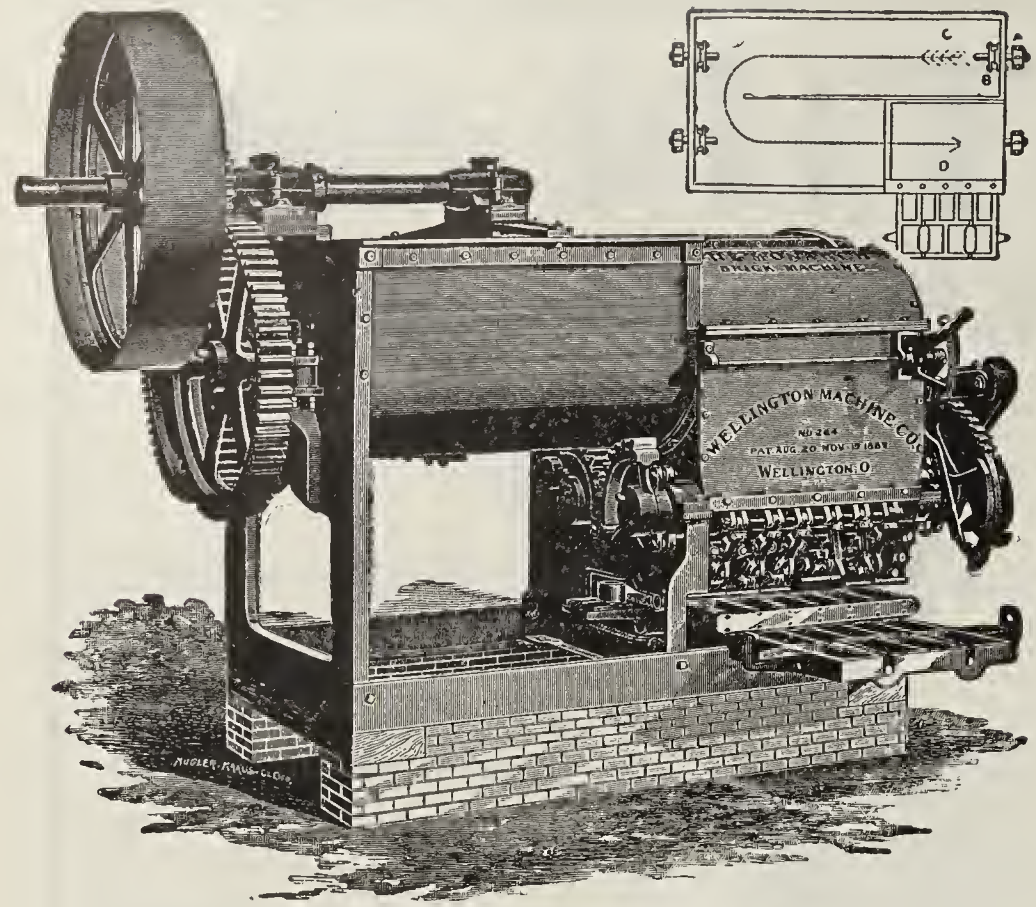




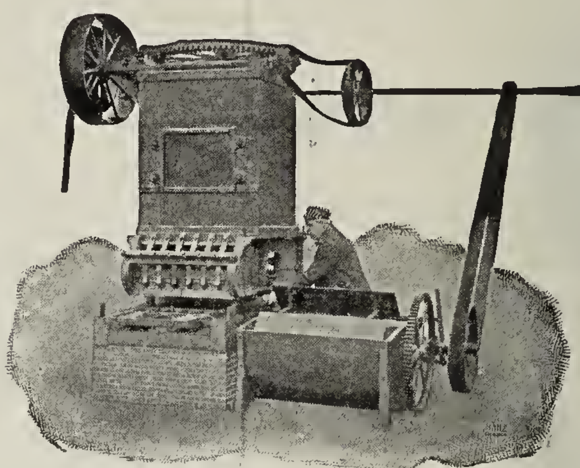
WE FURNISH EVERYTHING A BRICKMAKER NEEDS



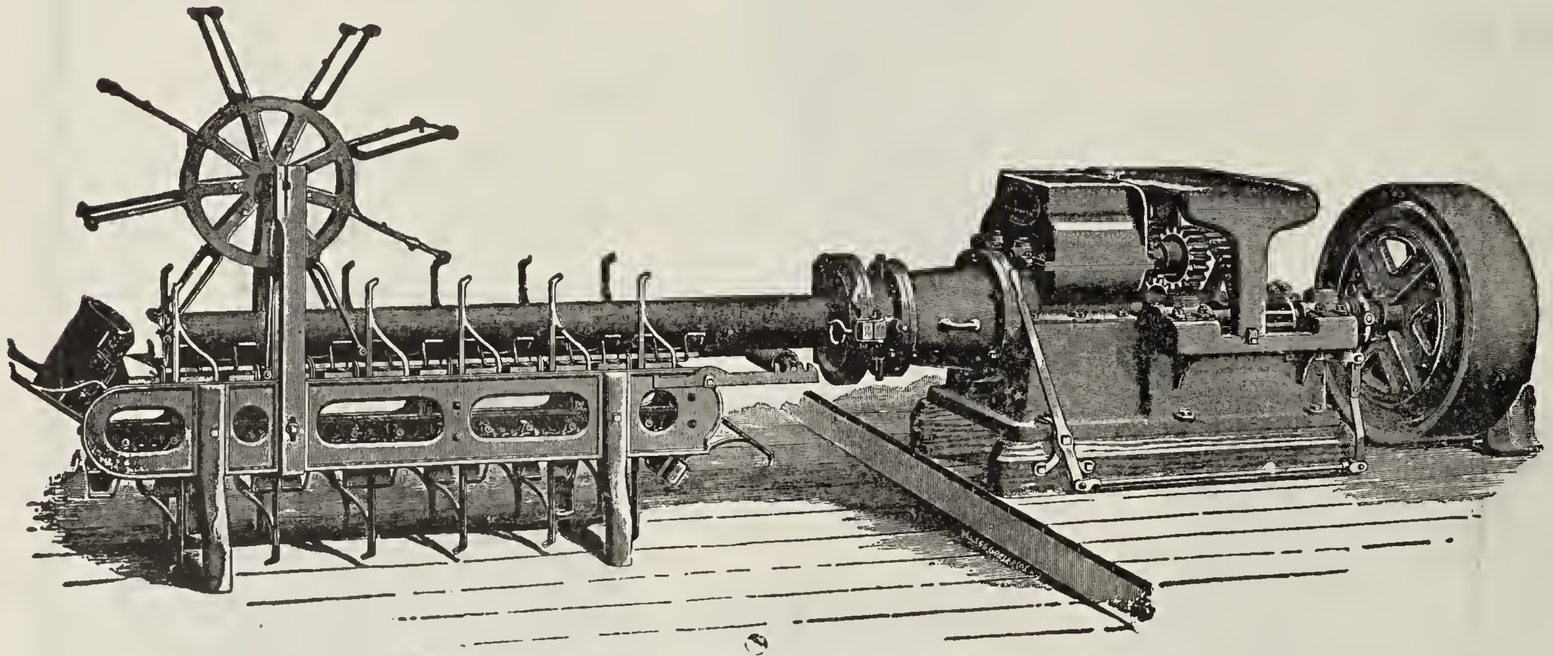
BRICK and TILE MACHINERY



MONARCH STOCK BRICK MACHINE
Capacity, from 30,000 to 50,000



THE QUAKER
Horse or Steam Power. Capacity, 20,00 to 35,000

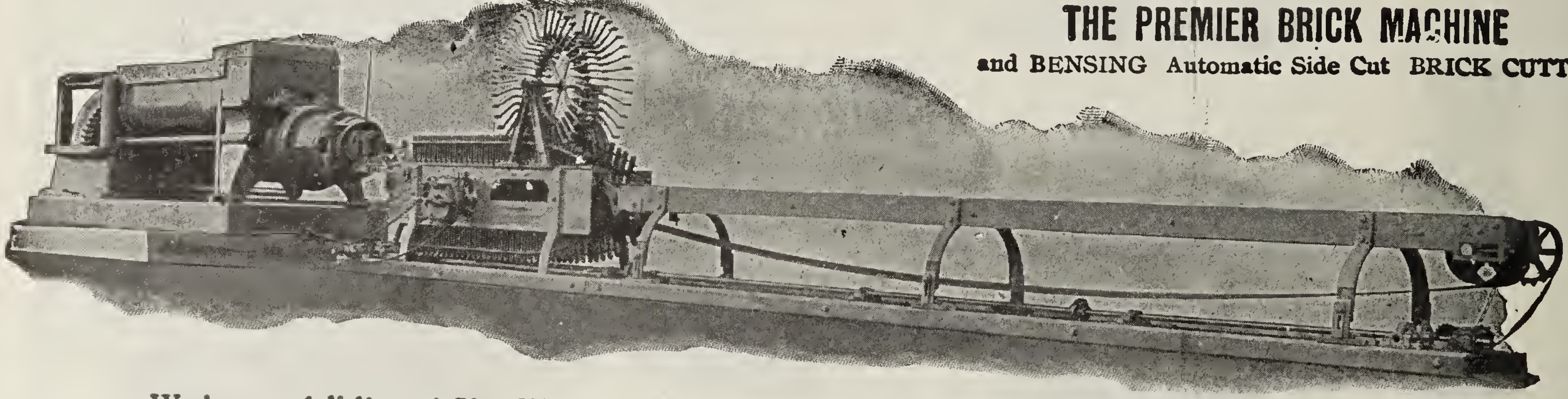


BRICK OR TILE MACHINE, WITH AUTOMATIC TABLE

"We Fulfill our Guarantees."

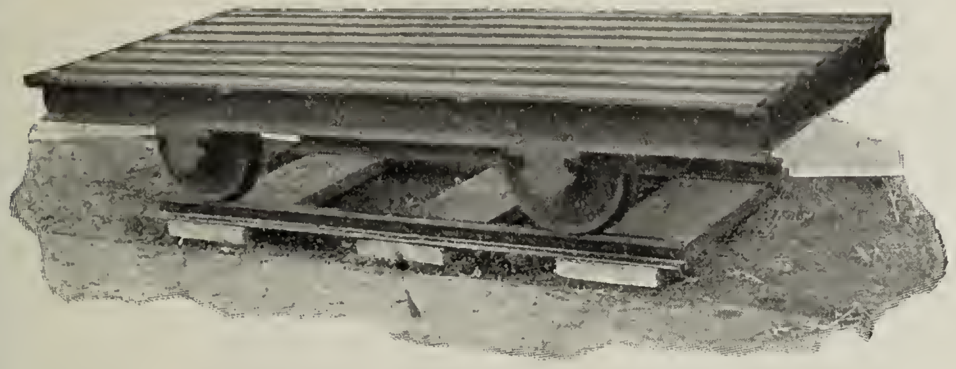
THE PREMIER BRICK MACHINE

and BENSING Automatic Side Cut BRICK CUTTER.

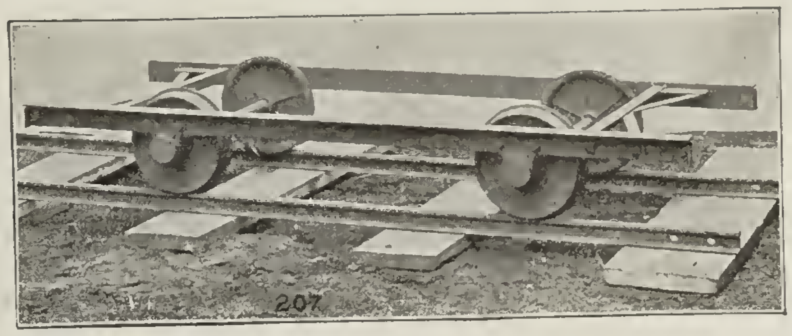


We have a full line of Clay-Working Machinery, sand mold brick machines, auger brick and tile machines, Automatic side and end cut tables, dies, molds, barrows, trucks, sanders, represses, pug mills. *The only down cut, reel side brick cutter on the market for cutting face brick that do not require repressing.* We can guarantee to make you a better face brick with this cutter than you can get from any other cutter on the market.

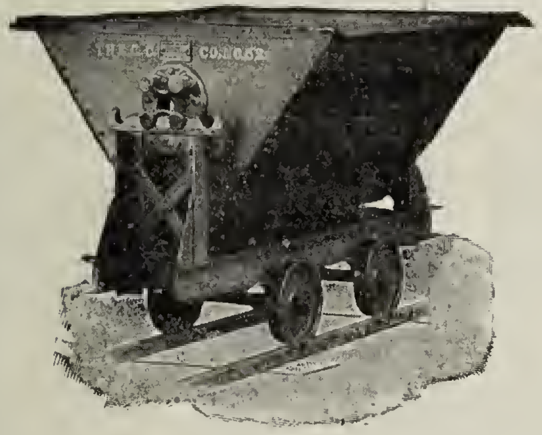
B. E. LaDOW, 701 Dwight Building, KANSAS CITY, MO.



No. 212.
STEEL DECK CAR, CHANNEL FRAME.
For Drying Brick, Sewer Pipe, Etc.



No. 207.
FLAT CAR, WOODEN DECK.
For Brick, Tile, Etc.



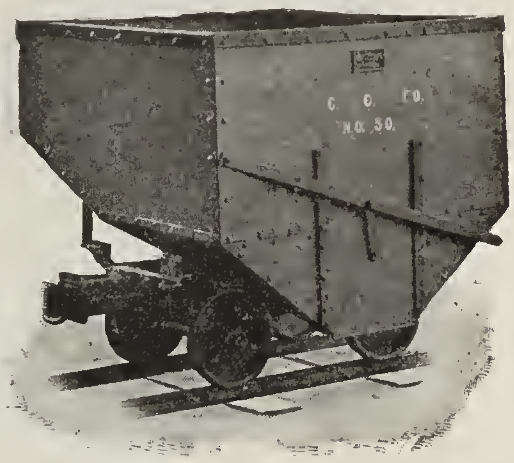
No. 52.
TRUNION DUMP CAR.
For Handling Coal, Sand, Ashes, Etc.

The Cleveland Car Company

West Park -:- Ohio

Designers and Builders of

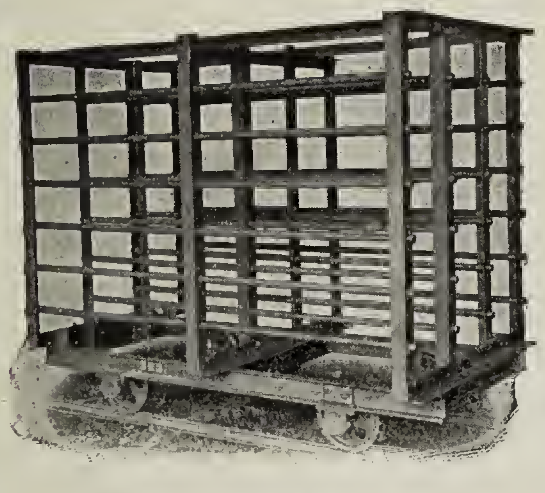
Complete Equipment for Narrow Guage Railroads



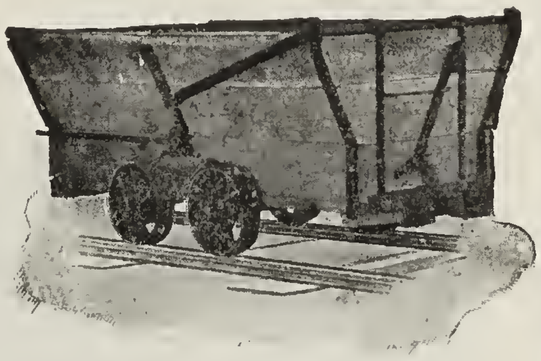
No. 50.
ONE SIDE DUMP CAR.
For Dumping Into Dry Pans, Disintegrators and Crushers.

Dryer Cars of Every Description, Dump Cars, Turn Tables, Transfer Cars, Switches, Frogs, Rails, Etc.

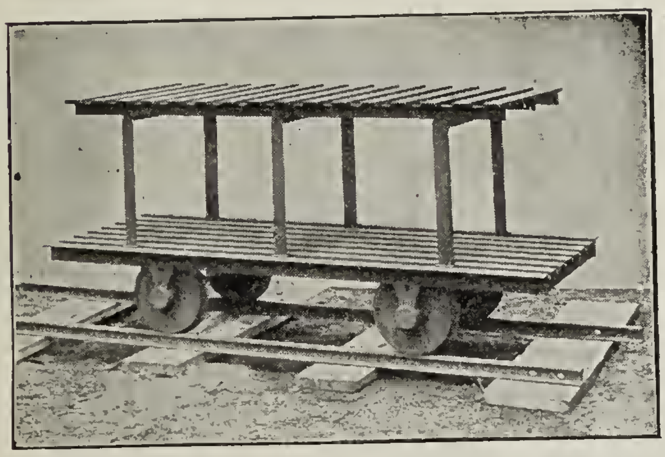
Overhead Trolleys, Kiln Doors, Furnace Fronts, Grate Bars and Brick Barrows : : : :



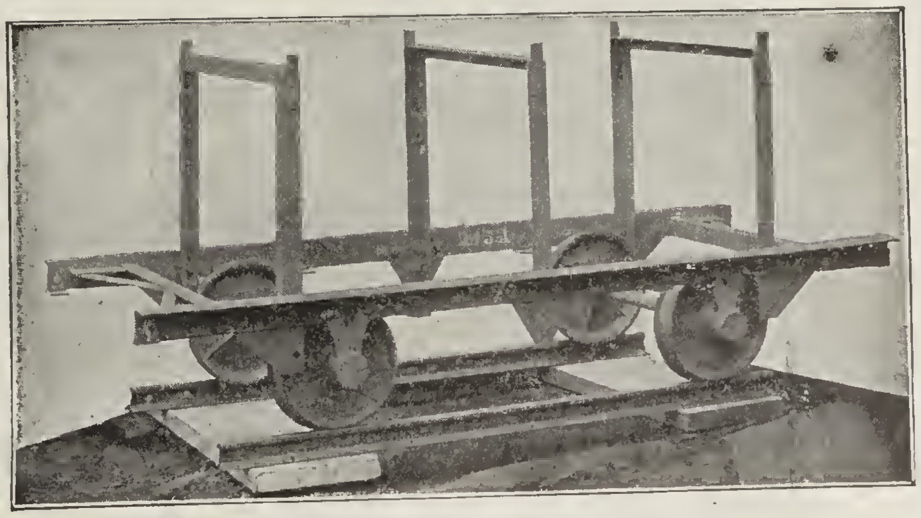
No. 523.
RACK CAR, HEAVY TYPE.
For Use With Coke Oven, Furnace and Cupola Block.



No. 31.
END DUMP CAR.
Adapted to Handling Coal, Shale, Sand, Etc.

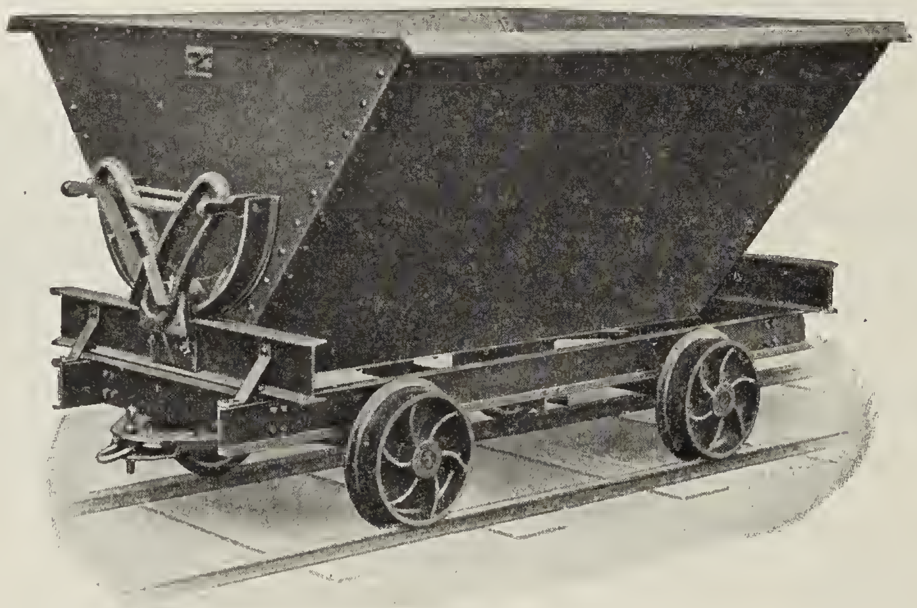


No. 244.
DOUBLE DECK CAR, STEEL DECKS.
For Brick, Tile, Fire-Proofing, Etc.



No. 215A.
DOUBLE DECK CAR, WOODEN DECK.
For Brick and Other Clay Products.

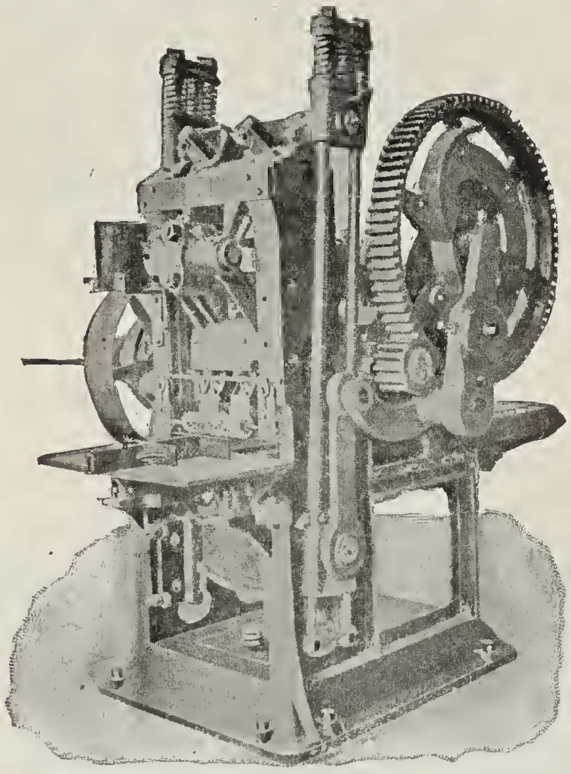
Are Your Clay Cars Satisfactory?-



Clay Car.

If not, we can send some which we guarantee will be. They have no chains or pins to get lost or broken, cars cannot overdump, are self-locking, self-centering, easy running and durable.

We also build dryer cars of all kinds for all purposes.



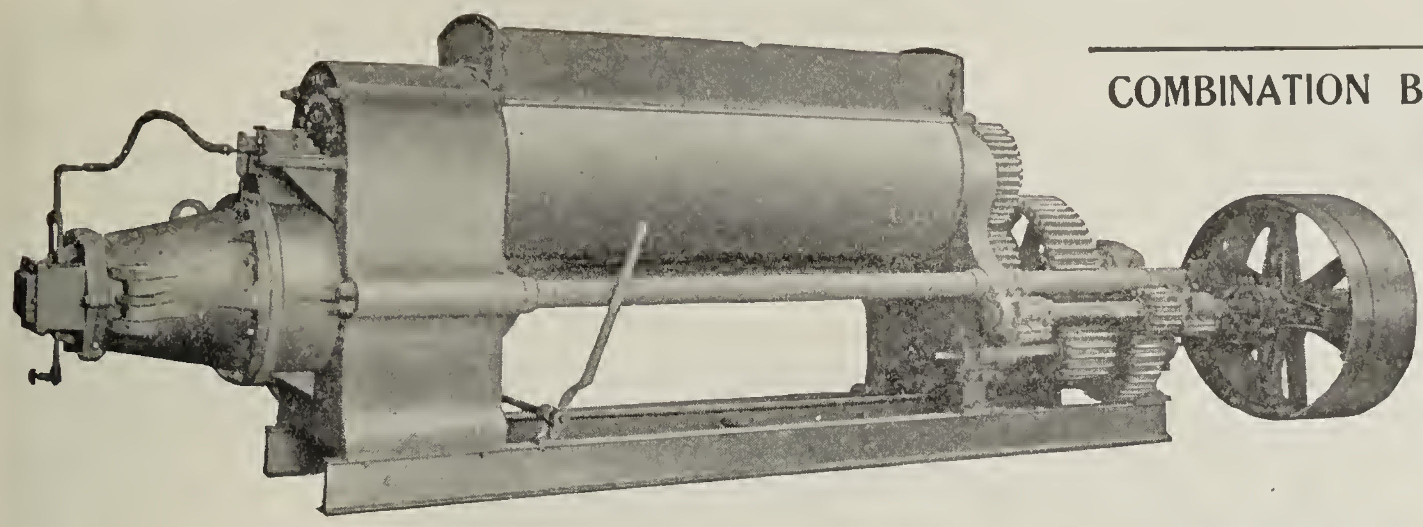
Richardson Double Die Repress.

The Richardson Repress has all the features of merit that are demanded of a machine of this kind. Has enough depth of mold to make the largest size paving brick. All the working parts are above dies out of the way of waste clay. It has a slow pressing movement with double pressure, bringing out distinctly all markings and lettering. The working parts are adjustible to wear. It requires very little power and costs little to keep in repair.

Kindly write us for catalogs and full information.

The Ohio Ceramic Engineering Company

50-56 Fall Street, Cleveland, Ohio.



COMBINATION BRICK MACHINE

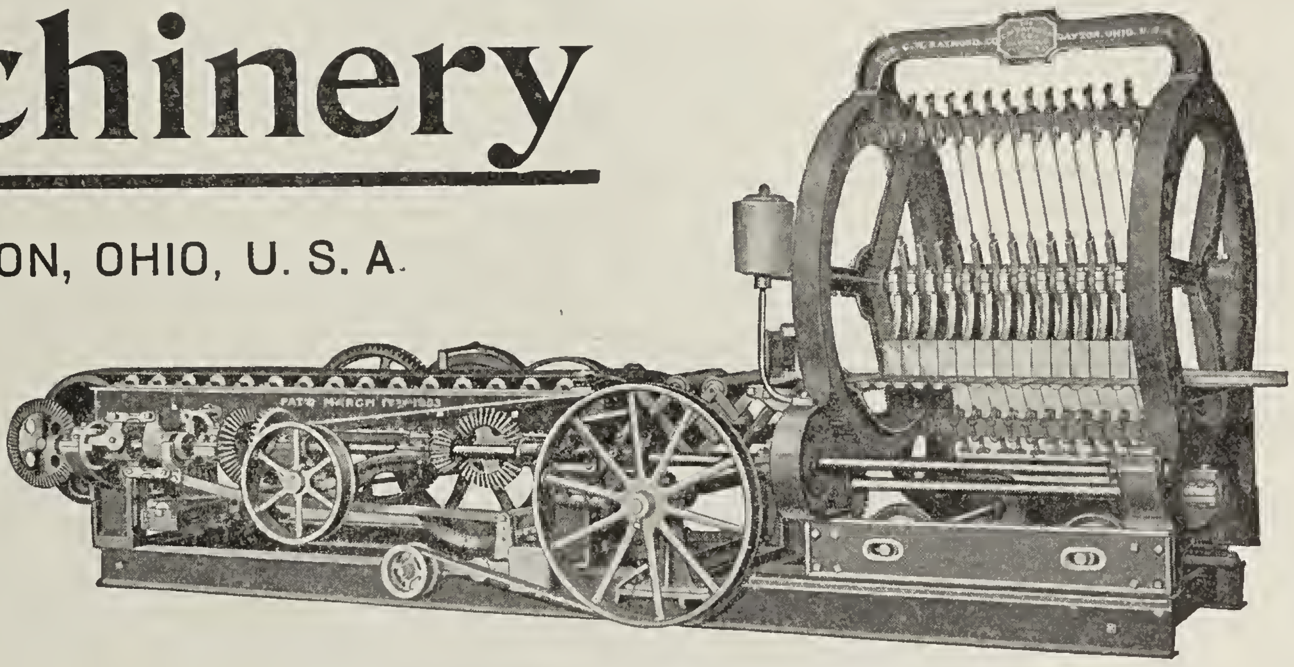
THE

C. W. RAYMOND CO

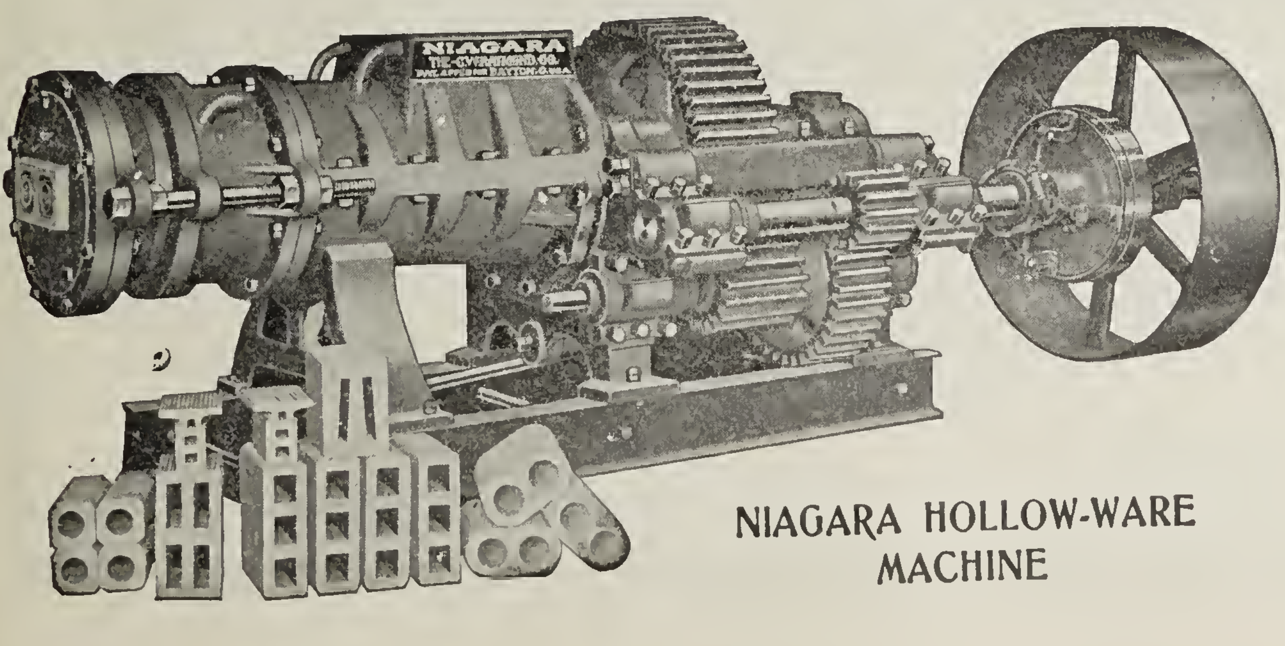
Clay-Working Machinery

DAYTON, OHIO, U. S. A.

NEW YORK
39—41 Cortlandt Street
ST. LOUIS
315 Frisco Building
PITTSBURG
1425 Park Building



AUTOMATIC DOWN-CUT CUTTER

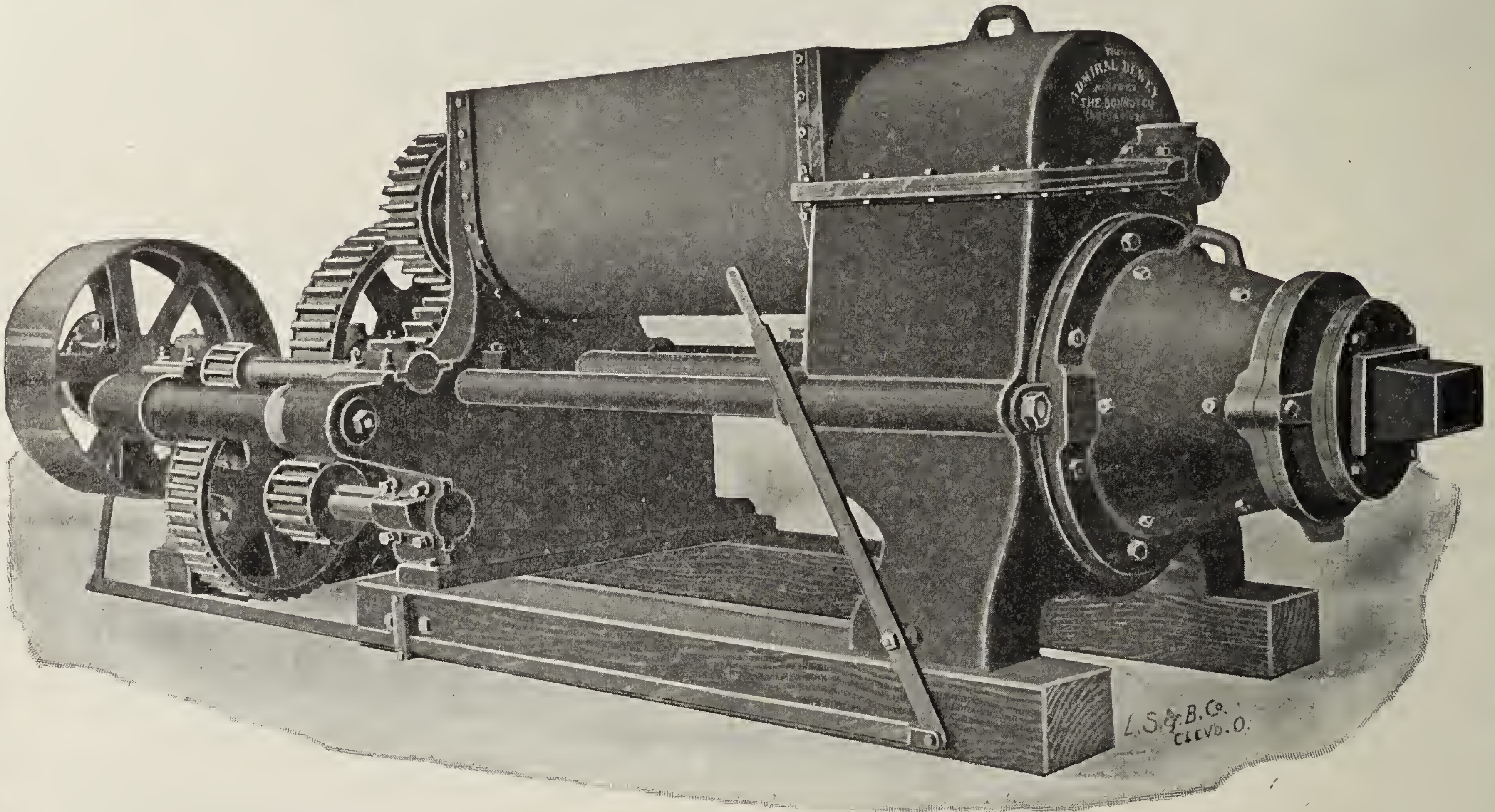


NIAGARA HOLLOW-WARE MACHINE

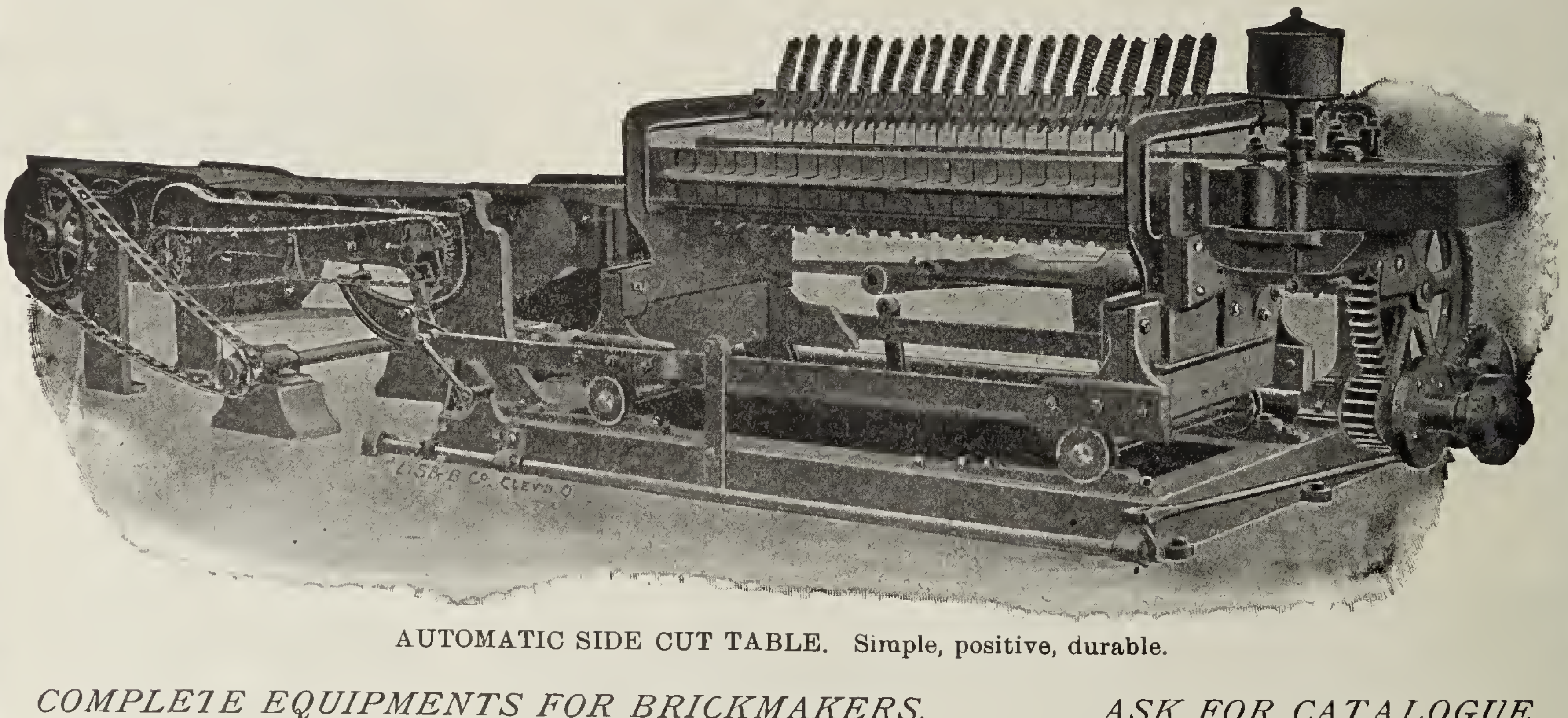
Raymond Machinery
Creates New
Business for the User
Better Brick
and more of them.

CATALOGUE

Modern Brick Machinery



SPECIAL COMBINED BRICK MACHINE AND PUG MILL 100,000 daily capacity.
AUGER BRICK MACHINES 10,000 to 100,000 capacity, five sizes.



AUTOMATIC SIDE CUT TABLE. Simple, positive, durable.

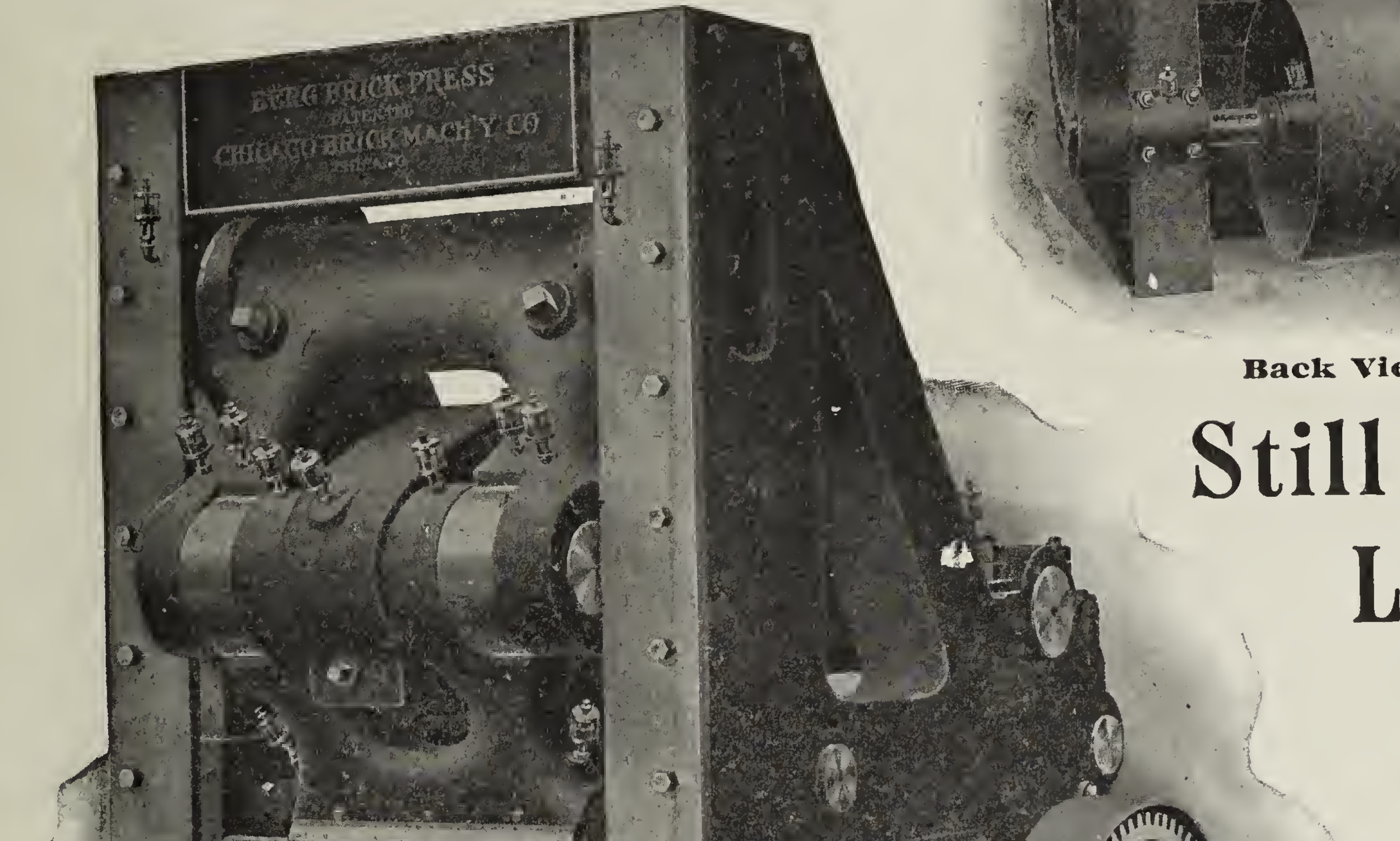
COMPLETE EQUIPMENTS FOR BRICKMAKERS. *ASK FOR CATALOGUE*

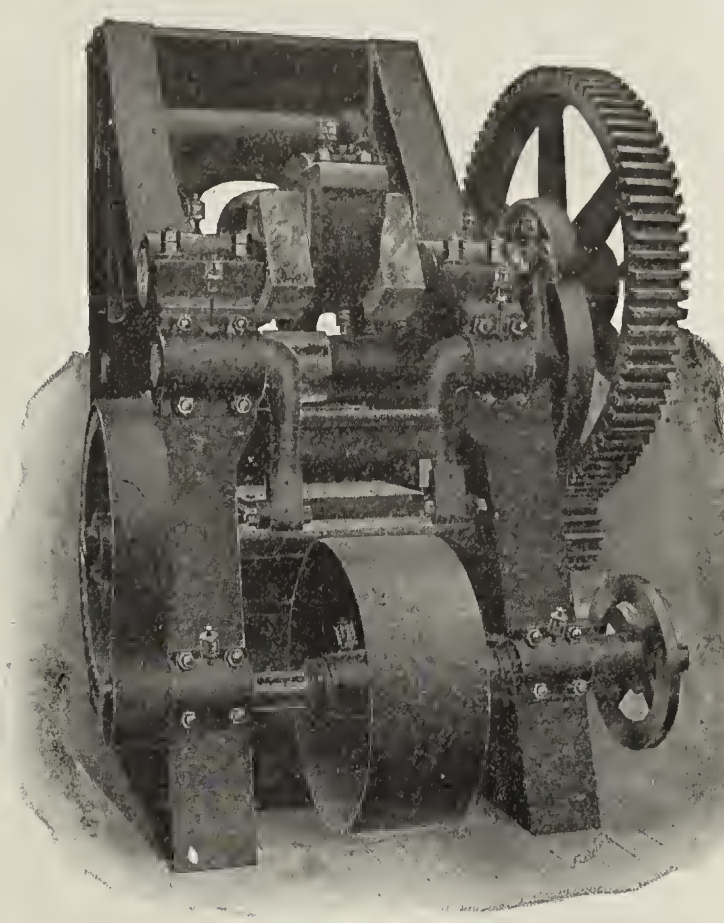
THE BONNOT COMPANY, Canton, Ohio.

—WESTERN AGENTS—

CHICAGO BRICK MACHINERY CO., - - 77 Jackson Boulevard, Chicago, Ill.

NEW MODEL
BERG BRICK PRESS





Back View.

Still in the Lead

AND

One Step Further Forward

Even stronger than ever and all self-contained. Greater pressure and fewer working parts than any other machine. Simple, massive, compact. Running mechanism placed in rear, as shown in upper cut, enabling this machine to be SHIPPED IN ONE PIECE.

MANUFACTURED BY
ANDERSON FOUNDRY & MACHINE WORKS
Anderson, Indiana.

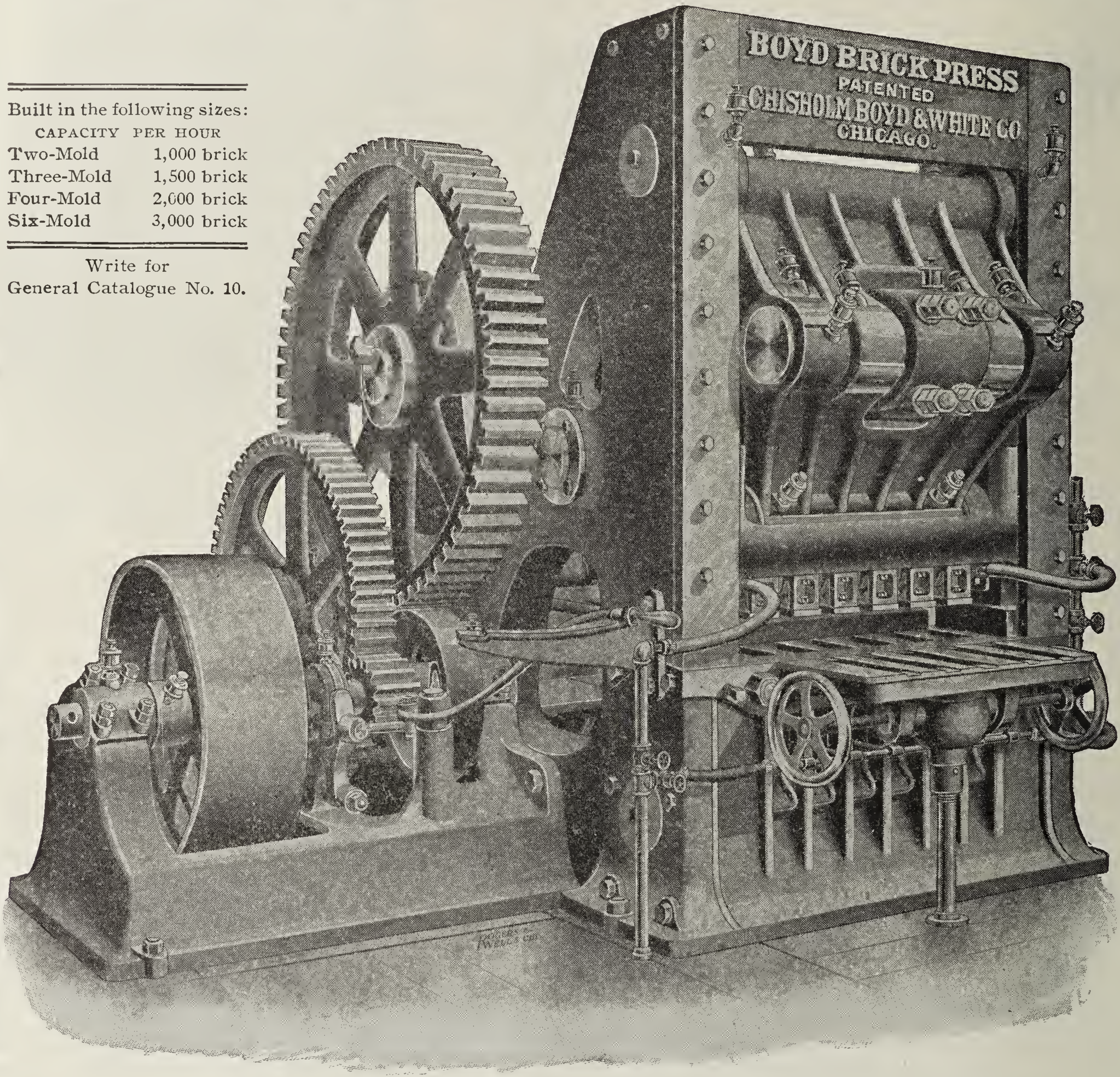
SOLD BY
CHICAGO BRICK MACHINERY COMPANY
77 Jackson Boulevard, Chicago.

The Boyd Brick Press

Built in the following sizes:

	CAPACITY PER HOUR
Two-Mold	1,000 brick
Three-Mold	1,500 brick
Four-Mold	2,000 brick
Six-Mold	3,000 brick

Write for
General Catalogue No. 10.



Another Record for the Boyd Press:

Six of our SIX-MOLD PRESSES in use on ONE YARD since 1892. Average cost of repairs for each machine One Dollar per year.

THE BOYD PRESS has always been distinguished for originality in design and construction. It will make better brick from clay or shale than can be made from the same material by any other press. It is selected and purchased by the most progressive Brick Makers. The largest and most successful brick plants in the country are using Boyd Presses.

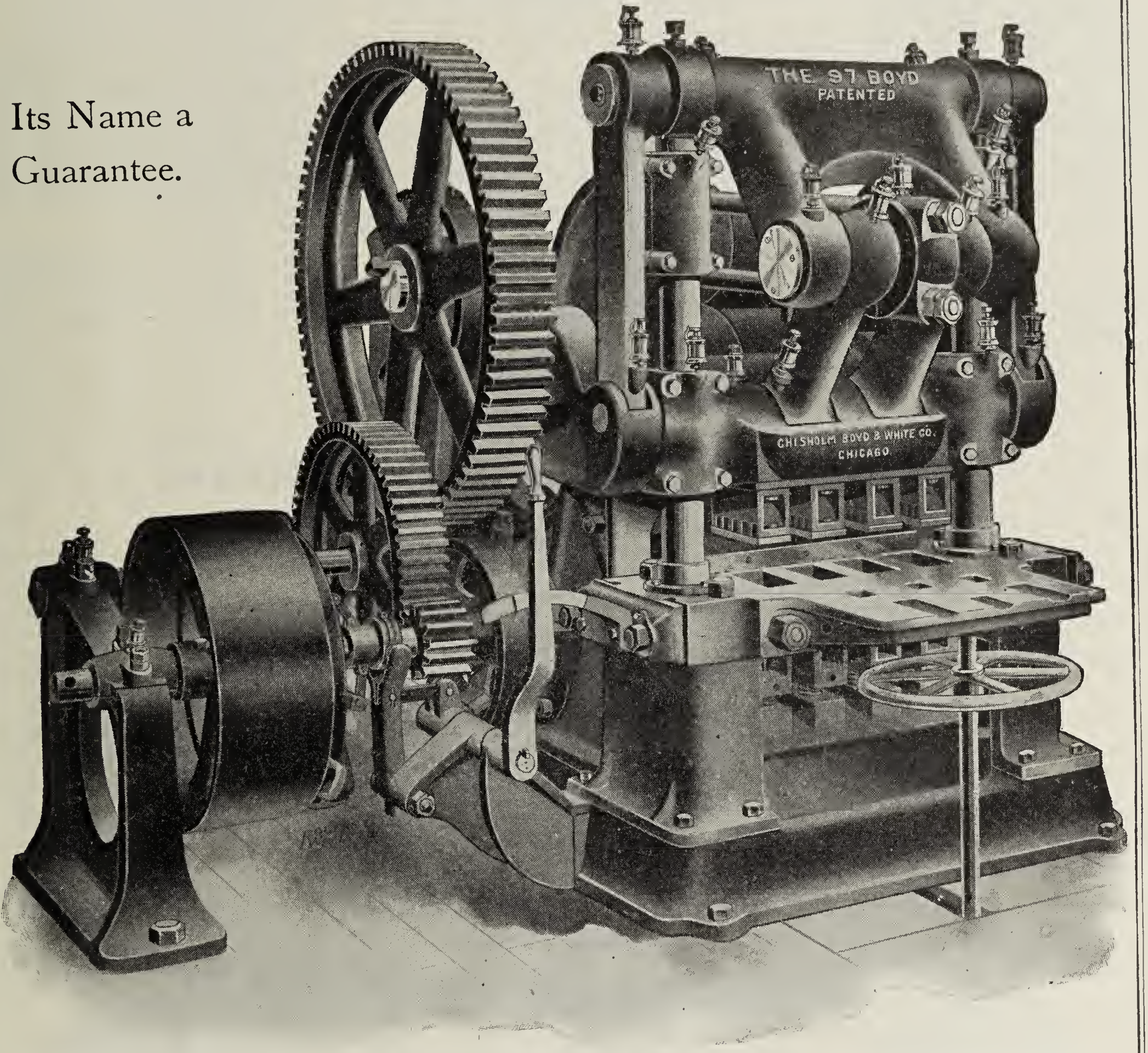
Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. CHICAGO, ILL.

The Boyd Brick Press

The '97 Model

Its Name a
Guarantee.



THE '97 MODEL BOYD BRICK PRESS has enormous strength and great durability; it is compact; the adjustments are convenient; it operates quietly and smoothly; the workmanship and material are of the best; the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking.

THE BOYD is the only Brick Press provided with an independent adjusting device for regulating the amount of clay in the molds and the pressure on the brick. This feature positively ensures equal pressure and finish on both sides of the brick, and no granulated or soft centers.

Sent on trial and fully guaranteed. Seventy presses of this pattern now in use. Cannot be broken in pressing brick. Write for descriptive catalogue No. 9.

Chisholm, Boyd & White Company

Office and Works, 57th and Wallace Sts. **CHICAGO, ILL.**

BRICKMAKERS:

The proof of every pudding is in the eating of it. Below are some remarks from one who has tried the pudding recently. We can produce much similar testimony from those whose experience stretches over a long period of years.

This is the age of great achievements, and in the field of Brick Press development we claim to lead them all.

Write for our catalog and let us tell you why the Ross-Keller is better for pressing Clay or Shale or Sand-Lime or Cement than any other.

VISTA HERMOSA
SUGAR AND MERCANTILE COMPANY
SUITE 1018 ASHLAND BLOCK
CHICAGO
Works at Vista Hermosa, Mexico

March 24, 1905.

Ross-Keller Triple Pressure
Brick Machine Co., St. Louis, Mo.

Gentlemen--We are pleased to inform you that the erection of our brick plant is now complete, and the Ross-Keller Press which we purchased of you is in good running order.

This Press is making the most beautiful brick we ever saw, and is giving us splendid satisfaction. We are more than pleased with the machine and can conscientiously recommend it to any one who is looking for a first-class, up-to-date Press.

We can see ahead of us a demand and a place for all the brick that we can make on the Ross-Keller, and the outlook for our brick enterprise is exceedingly promising.

With good wishes for your success, we beg to remain,

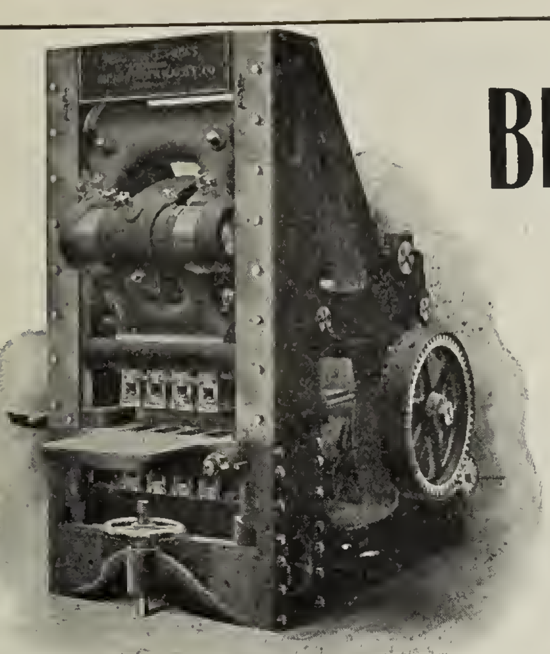
Yours very truly,
VISTA HERMOSA SUGAR & MERCANTILE CO.,
By DeWitt C. Bovee, Pres.

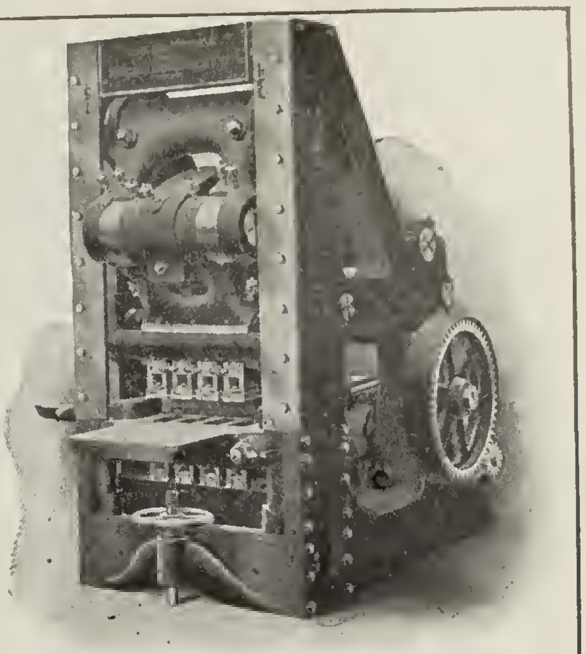
For prices and particulars address

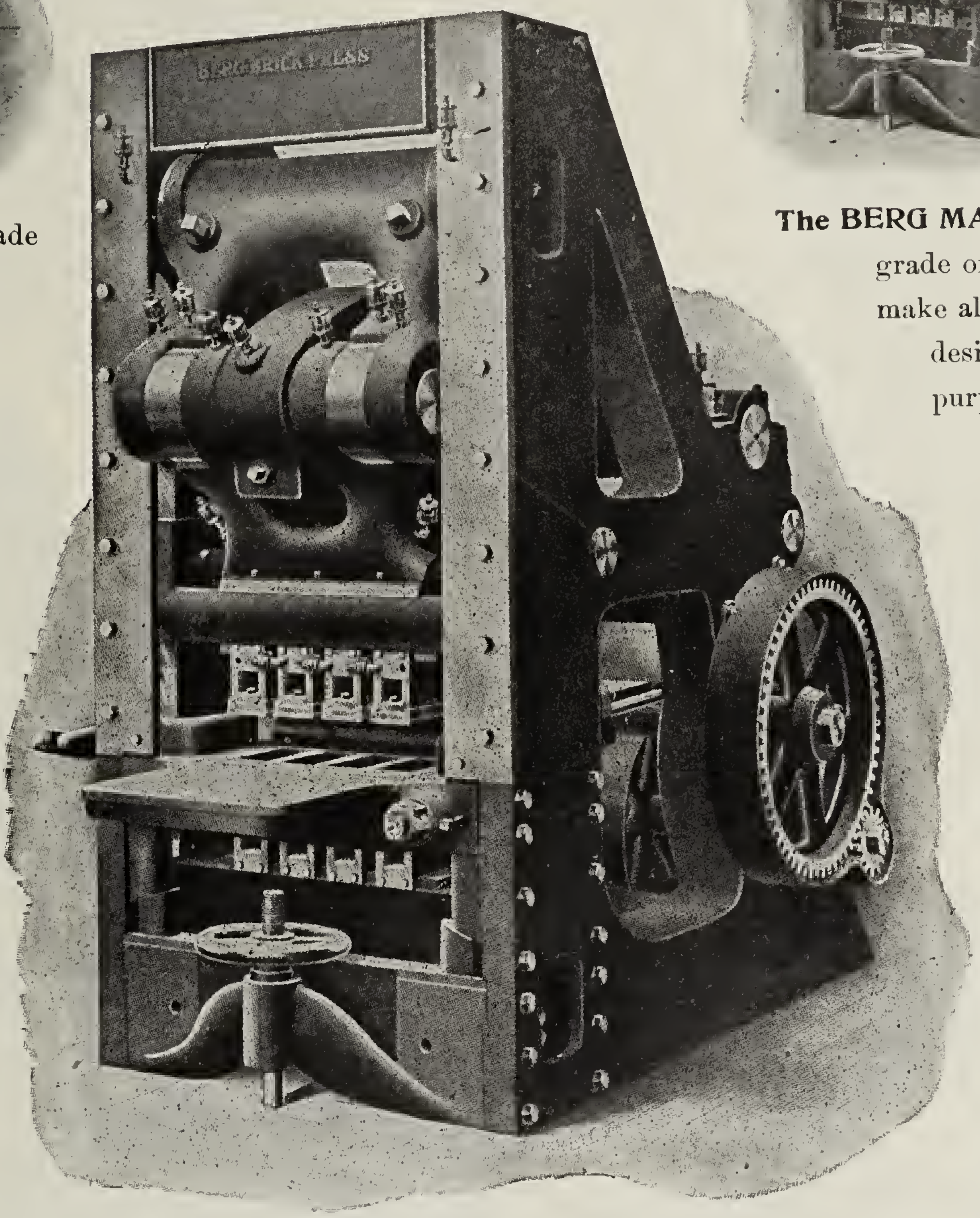
Ross-Keller Triple Pressure Brick Machine Co.
Fullerton Bldg., St. Louis, Mo., U. S. A.

BERG BRICK PRESS

The highest development of the Art of Brickmaking Machinery so pronounced by the United States Government.







The BERG for the highest grade of pressed brick of shale or clay. It makes all kinds of shapes and sizes of brick. Changes from one shape to another can be made in less than an hour's time.

First-Class Workmanship. Cut Gearing. Fully Warranted.

The BERG makes the best sand-lime brick and cheapest because it is the strongest machine and gives the highest pressure. Thirty-five sand-lime plants in United States use the **BERG** Brick Press SUCCESSFULLY.

The BERG MAKES the highest grade of fire brick. Can make all kinds of shapes desired for fire-brick purposes.

Three distinct pressures make the brick evenly pressed all through. No granulated centers of the brick.

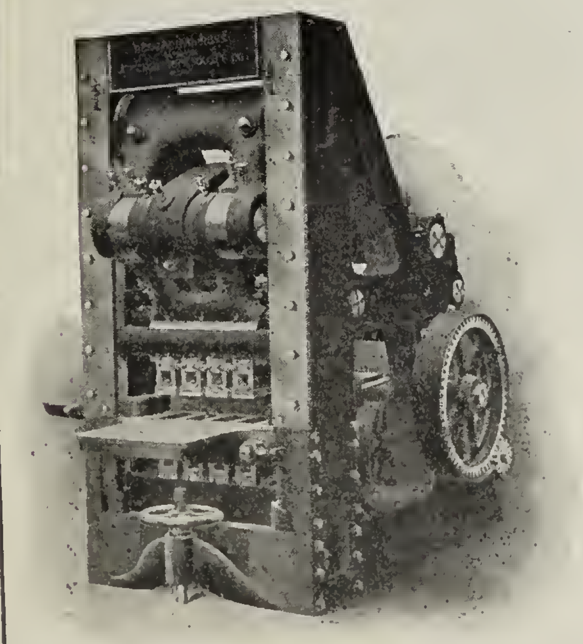
The BERG is the best for sand and cement because of its strong pressure. Uses less cement, makes cheaper brick.

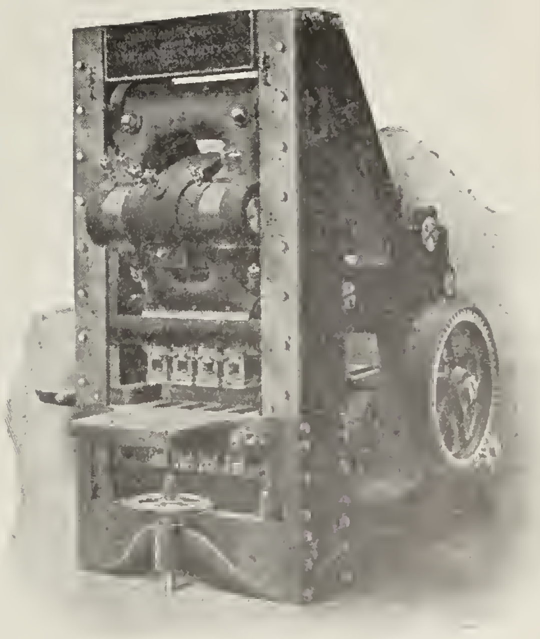
The 1905 Berg Press

Many other steps further forward in improvement and highest grade of material and workmanship, also cut gearing. Fully guaranteed as to its success. Manufactured by its inventor in Toronto, Canada, at the Bertram Engine Works Co. Plans and specifications on the different kinds of plants furnished, also all equipments.

For prices and full particulars, address

A. BERG
THE BERTRAM ENGINE WORKS
Toronto, Ontario, Canada

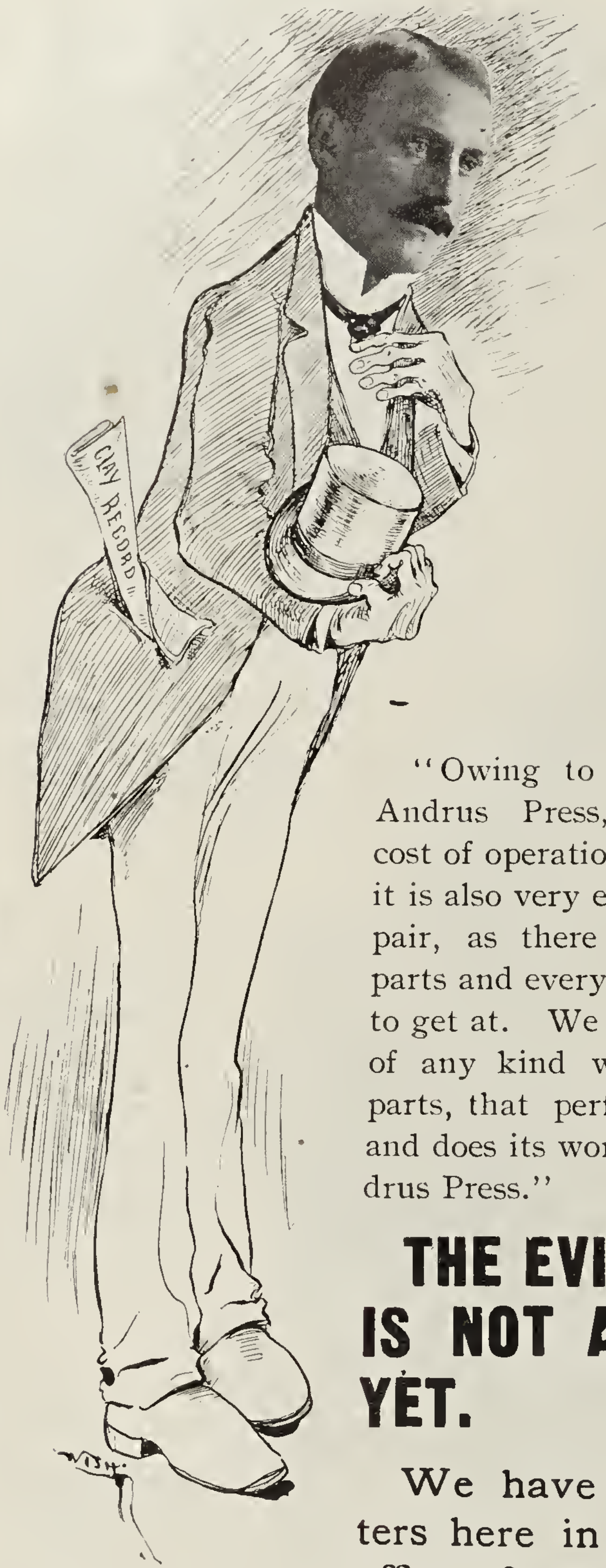




Even the Editor

Took Off His Hat

When We Cited the Following Instance:



Anthony Ittner Brick Company, with offices in the Odd Fellows Building, here in our city, have seven Andrus Presses on their yard at Bellville, Ill.

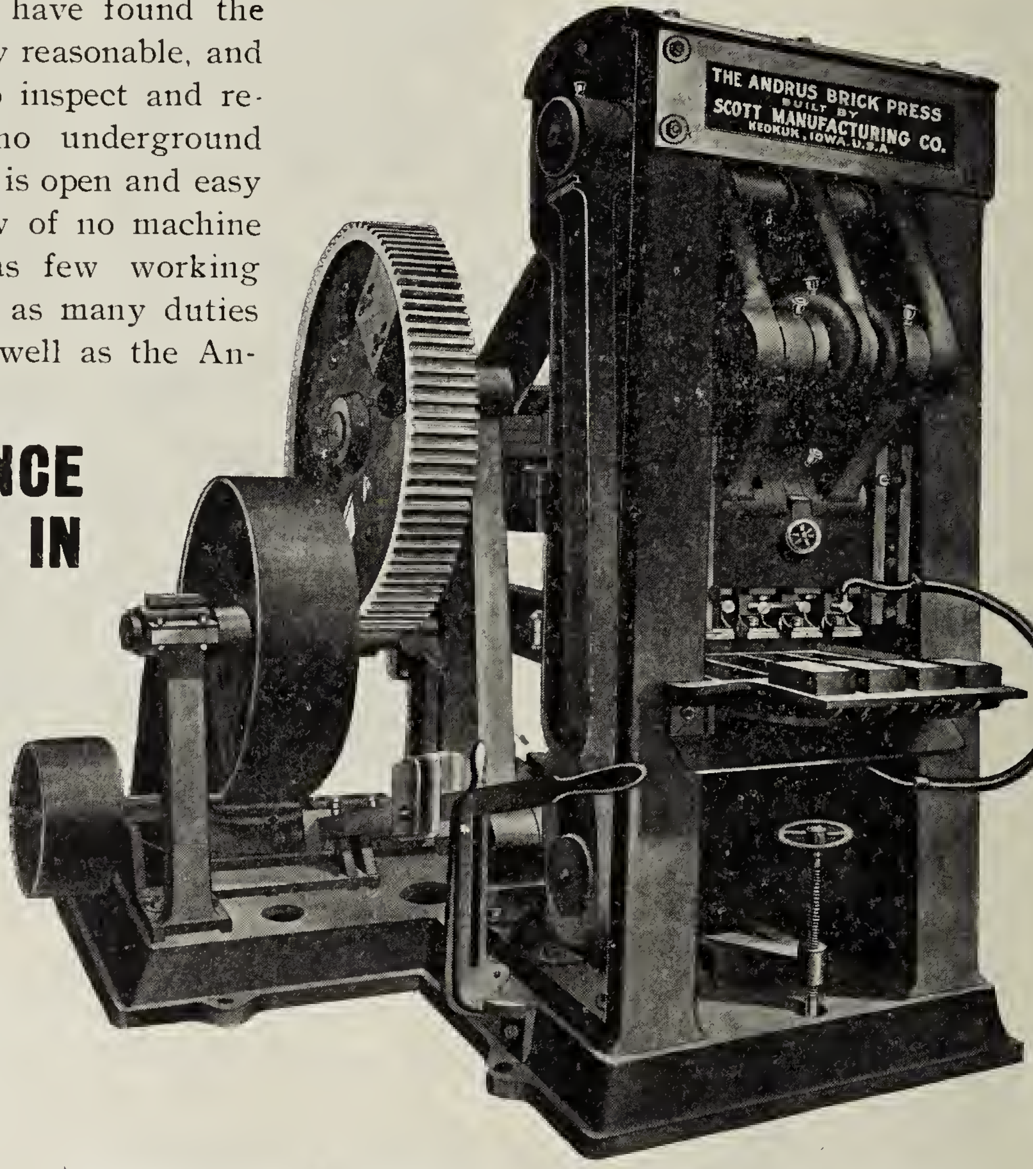
To show what they think of the machine illustrated below, we quote the following from their letter of recommendation:

"Owing to the simplicity of the Andrus Press, we have found the cost of operation very reasonable, and it is also very easy to inspect and repair, as there are no underground parts and everything is open and easy to get at. We know of no machine of any kind with as few working parts, that performs as many duties and does its work as well as the Andrus Press."

THE EVIDENCE IS NOT ALL IN YET.

We have letters here in our office from almost every state in the Union, all of which corroborate the above statements.

In addition to letters of recommendation, we have eighteen Andrus Presses in the St. Louis district "making brick every day."



THIS IS THE PRESS THAT SCOTT BUILDS.

SCOTT MANUFACTURING COMPANY

WORKS:
Keokuk, Iowa.

Commonwealth Trust Building

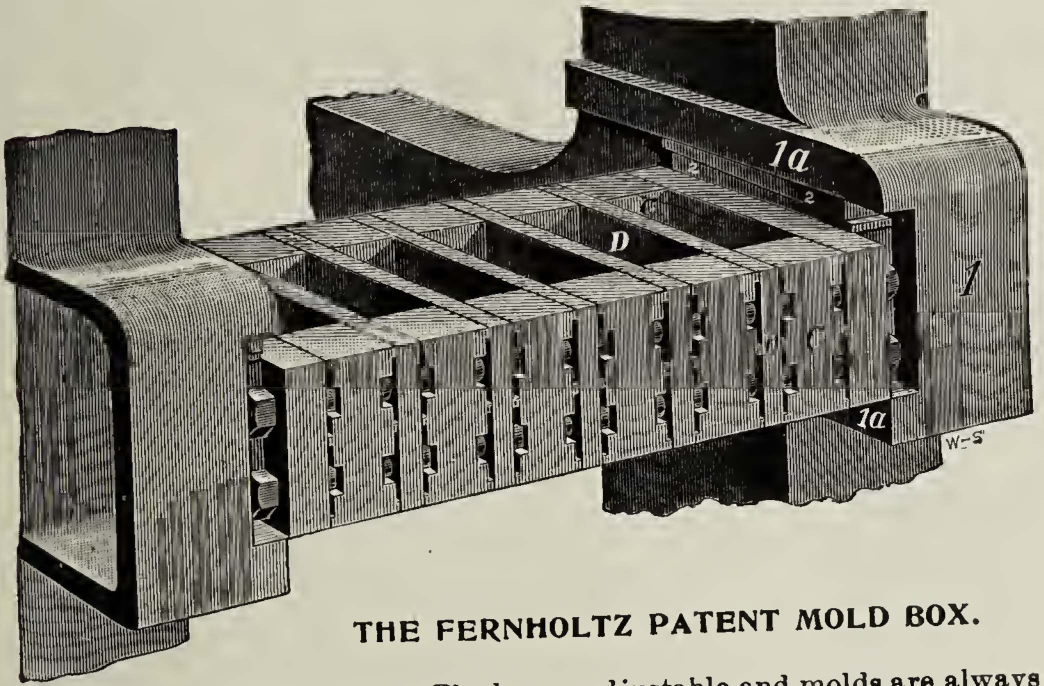
ST. LOUIS, MO.

THE FERNHOLTZ BRICK MACHINERY CO.

Manufacturers of

The Celebrated Fernholtz Dry Press

Four mold Press 20,000 daily capacity. Six mold Press 30,000 daily capacity

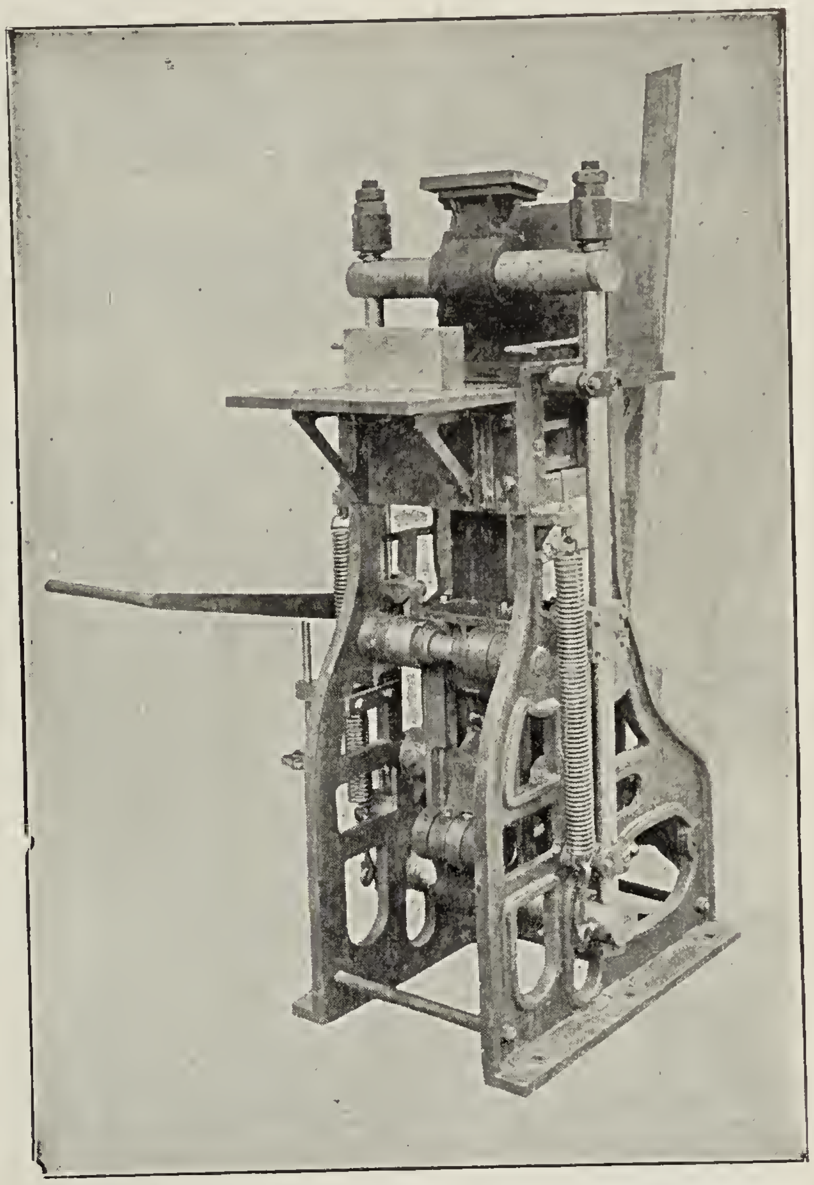


THE FERNHOLTZ PATENT MOLD BOX.

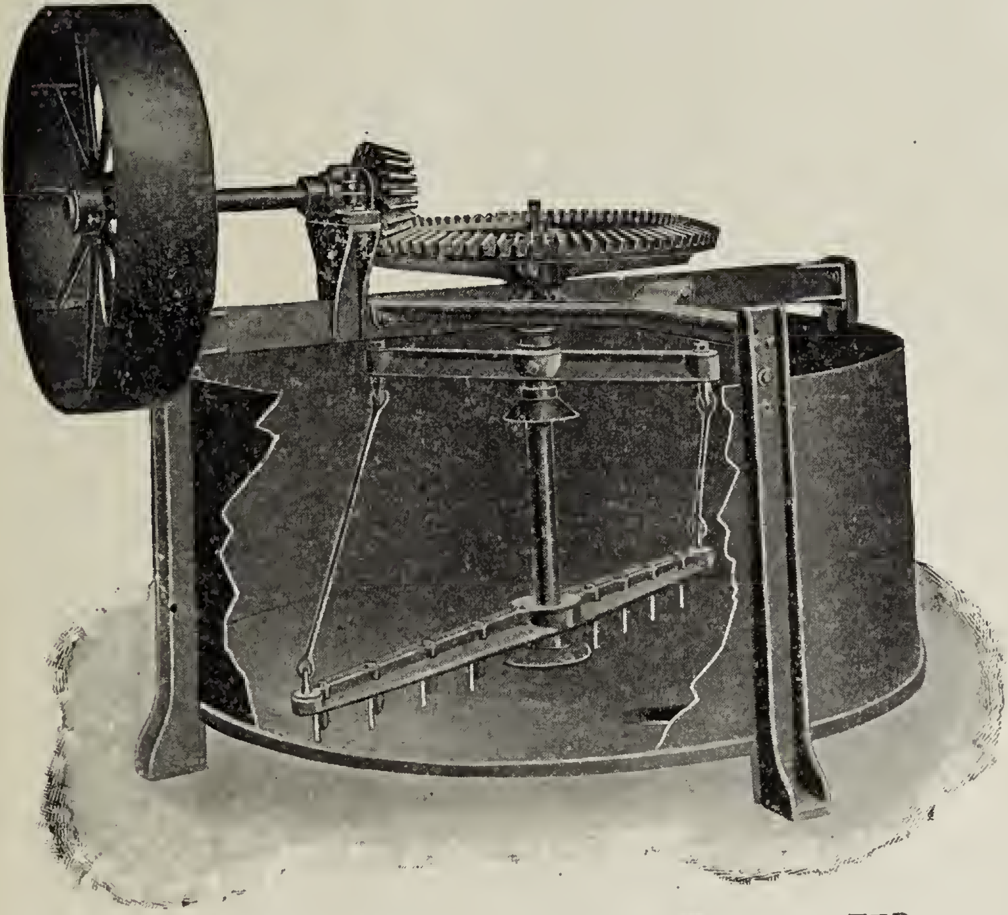
No old style Liners The Blocks are adjustable and molds are always one size. We have put them in most all makes of Dry Press machines. Easily and quickly adjusted. They are made entirely out of chilled iron, the hardest known metal.

GRATH PATENT HAND POWER PRESS.

Especially adapted for ornamental designs Any size brick up to 12⅝ inches long, 10 inches wide and 4¼ inches thick.
Brick set into kiln direct from press.



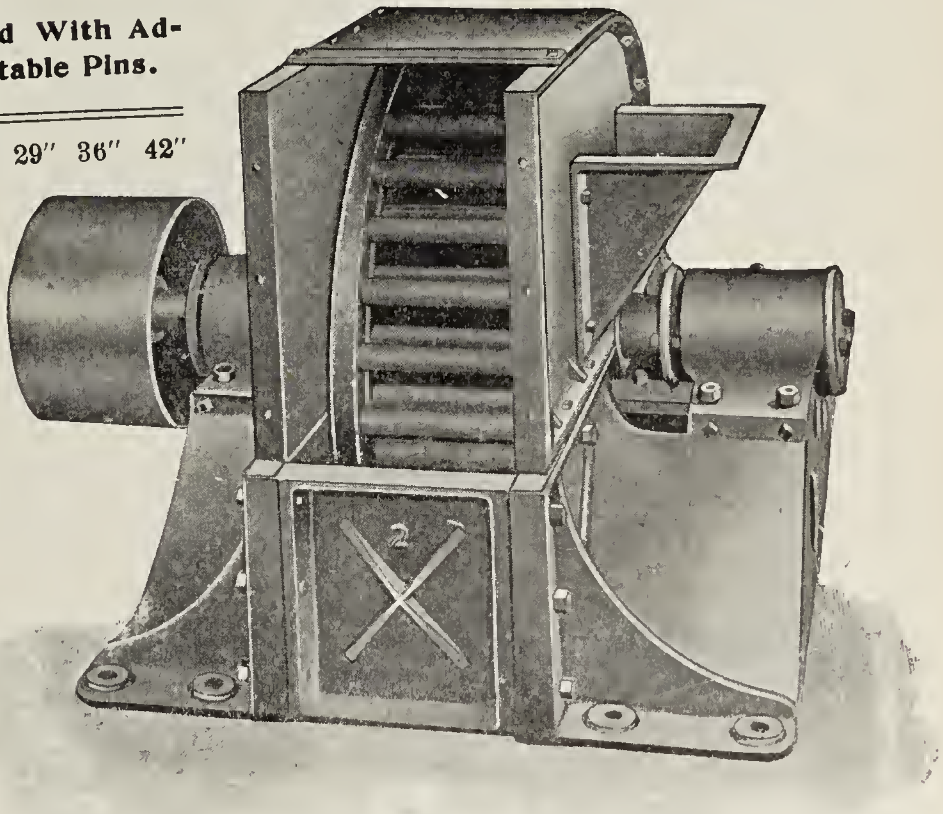
GRATH PATENT HAND POWER PRESS.



A GOOD MIXER IS ALWAYS APPRECIATED.

Fitted With Adjustable Pins.

Sizes 29″ 36″ 42″



THE FERNHOLTZ CLAY PULVERIZER.

The Fernholtz Brick Machinery Co.

Cable Address "Fernbrick." Western Union Code.

Boyle Avenue and Old Manchester Road, ST. LOUIS, MO., U. S. A.

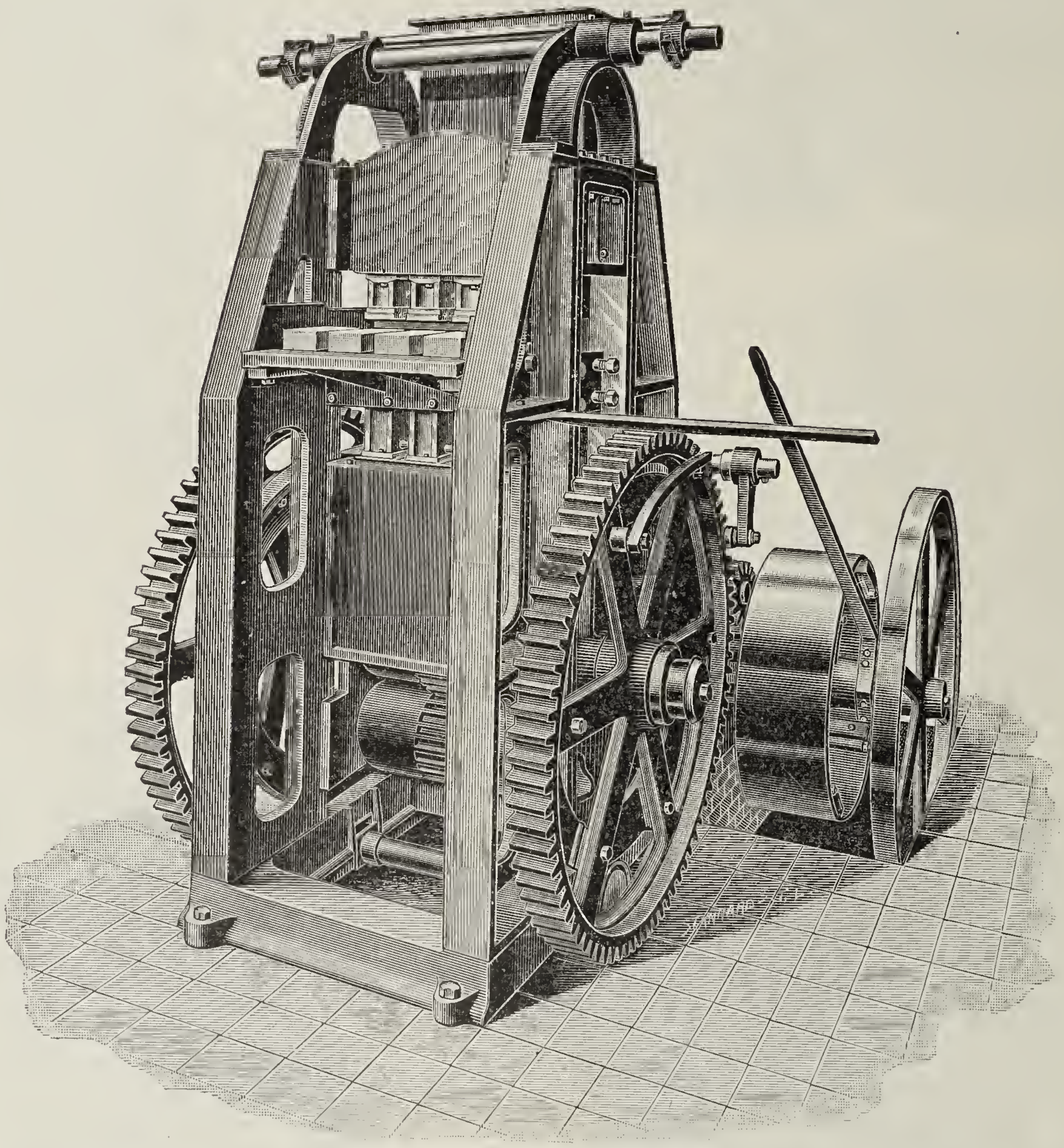
PERFECTION REALIZED

IN THE

RELIANCE DRY PRESS BRICK MACHINE

(PATENTED)

Main
Features:
Strength
Durability
Simplicity
Saves Fuel
and
Costs Less



No
Toggles
No
Links
No
Pins
to
Wear

STRONGEST AND MOST POWERFUL BRICK PRESS ON THE MARKET

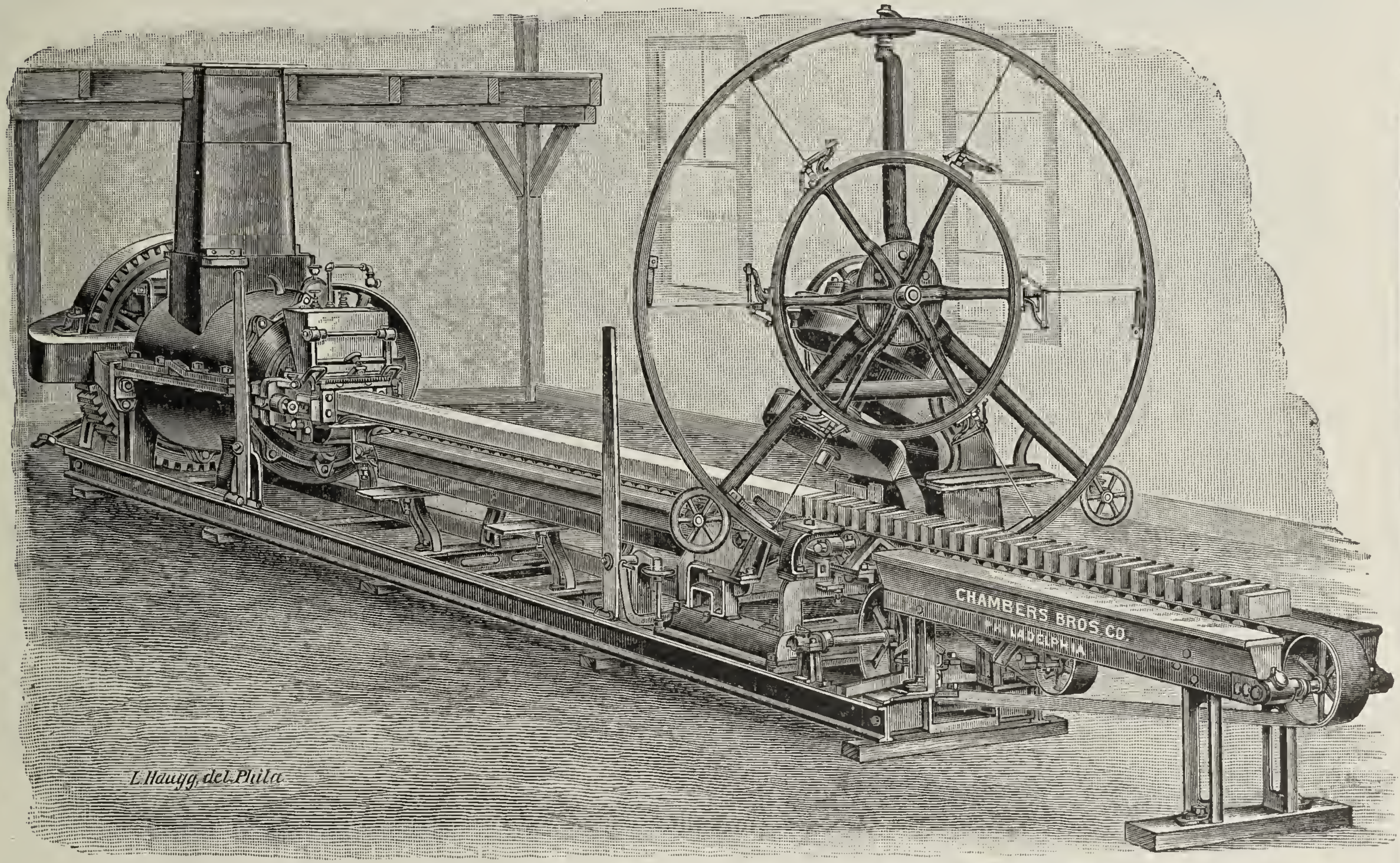
FOR PRICES AND FURTHER PARTICULARS ADDRESS THE

RELIANCE MACHINE AND TOOL WORKS
ST. LOUIS, MO.

MACHINERY FOR BUILDING BRICK

AND FOR STREET PAVERS

ROUND CORNER PAVING BRICK WITHOUT REPRESSING


CHAMBERS BROS. CO.
PHILADELPHIA
L. Haugg, del. Phila.

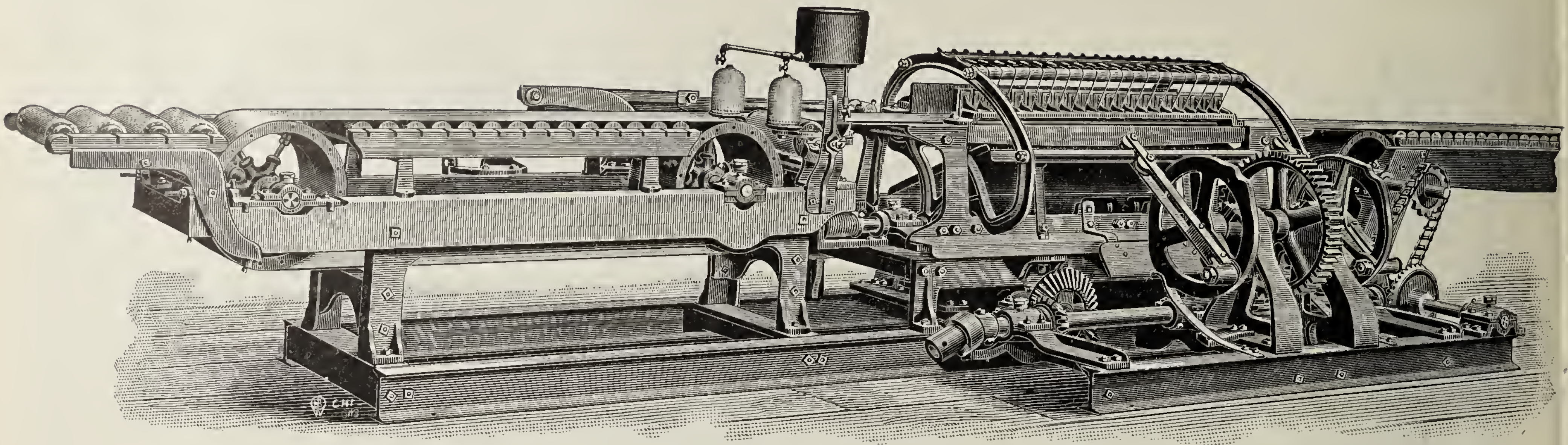
THE CHAMBERS AUTOMATIC SIDE-CUT BRICK MACHINE.

Automatic End Cut Brick Machines of five sizes, having capacity from 10,000 to over 100,000 brick daily under favorable conditions.

CHAMBERS BROTHERS COMPANY

52D AND MEDIA STREETS
PHILADELPHIA, PA.

E. R. FRAZIER, Chicago Agent,
59 West Jackson Boulevard.



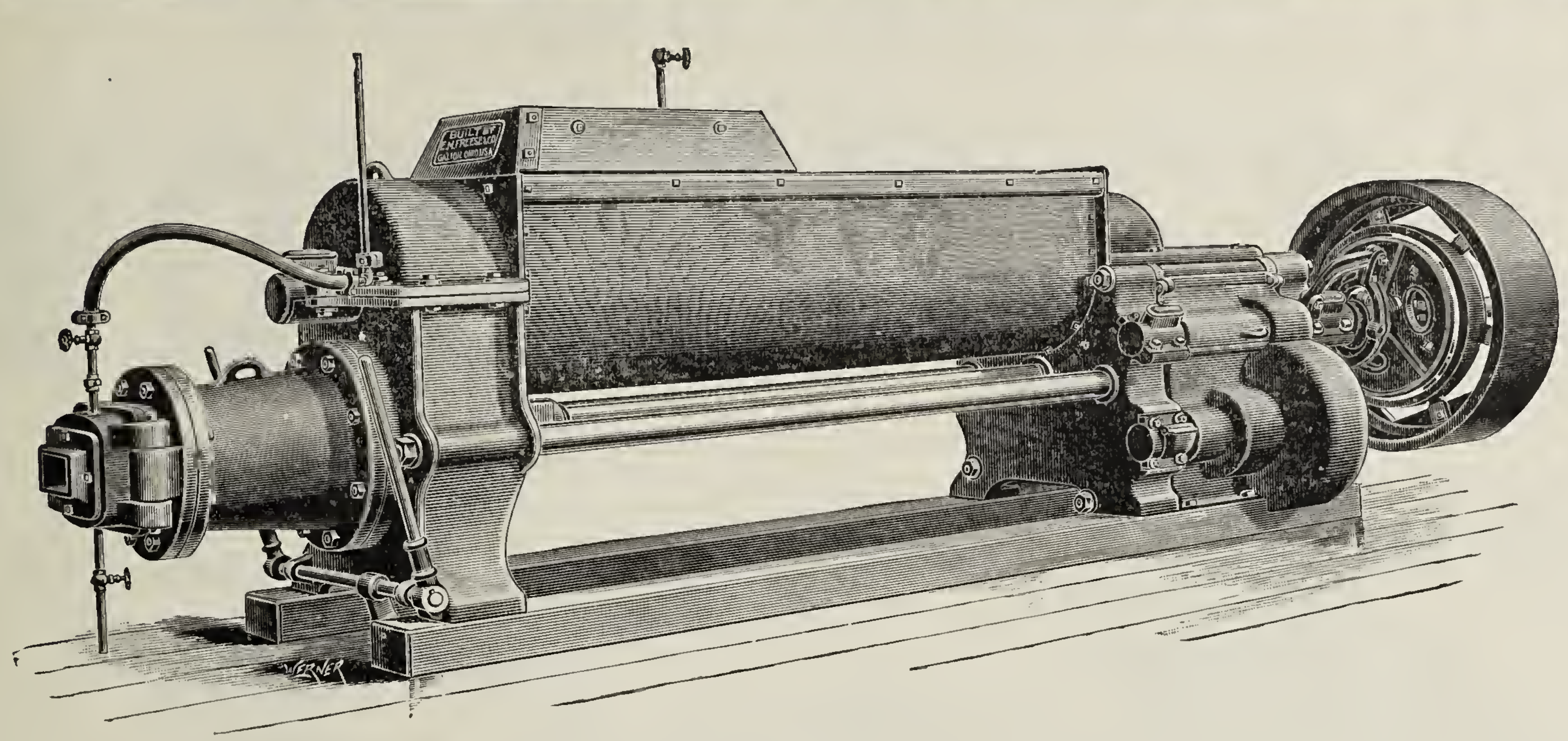
The Designs of Brewer Automatic Cutters

are all of striking simplicity, and it's right there that their popularity originates. Mechanical complications may be all right some places, but not on a brickyard. Simple machines that will do the business are the ones experienced brickmakers are buying now-a-days, and we are selling 'em.

H. BREWER & COMPANY

TECUMSEH, MICH., U. S. A.

UNION BRICK MACHINES



We build these Machines in five sizes. Capacities to 10,000 brick per hour.

Several hundred are in everyday use. They do first-class work and are convenient, economical and durable. This can be verified by investigation.

We also build Brick Machines with separate Pug Mill.

Don't forget our Automatic Cutters. **They give satisfaction.**

State your requirements and let us furnish particulars.

E. M. FREESE & CO.

GALION - - - - OHIO

LAMINATION is the source of more loss, more worry and more anxiety than all other troubles of a brickmaker

KENTON C READ, Pres. ANDY O'CONNELL, Vice Pres. and Gen'l Mgr C. M. MILLER, Sec.-Treas.

THE
C. M. Miller Mfg. and Mining Co. Inc.
MAKERS OF
High Grade Veneer and Building Brick
Office, 331 Ohio Street.
New Phone 1142.

Terre Haute, Ind. Dec. 22, *190*4.

Mr. H. L. Hix, Mgr.
The Wallace Mfg. Co., Frankfort, Ind.:

Dear Sir—I feel that I must tell you my experience with the brick made on the Intermediate Wonder:—

A few days ago a very prominent contractor asked me to bring him some samples of our brick. I fixed up some samples and started to his place, and just as soon as he saw them, he said: "I don't want them—they are no good; I would not lay one of that kind of brick," but I begged him to look at them and tell me why he did not want them. He asked me if he could break one of them, and I said, "Yes, break all of them." So he took his hammer and hit one on the corner; then he looked up at me and said: "I never saw a stiff mud brick like that;" then he broke it all up, just as nice as any brick, and he said: "That is the first stiff mud brick I ever saw without lamination," and that they were all right.

We are now selling our brick as fast as we can deliver them.

Pardon me for taking your time, and with SUCCESS to the WONDER, I am,

Yours very truly,

Andy O'Connell
V P and Gen Mgr.

In the event that you want to make brick filled with LAMINATION, CRACKS and CROOKS, a Wonder Machine will not answer your purpose.

THE WALLACE MFG. CO.

FRANKFORT, IND., U. S. A.

NO DOUBT ABOUT IT—

It is a Fact, conceded by every User, that the

WONDER

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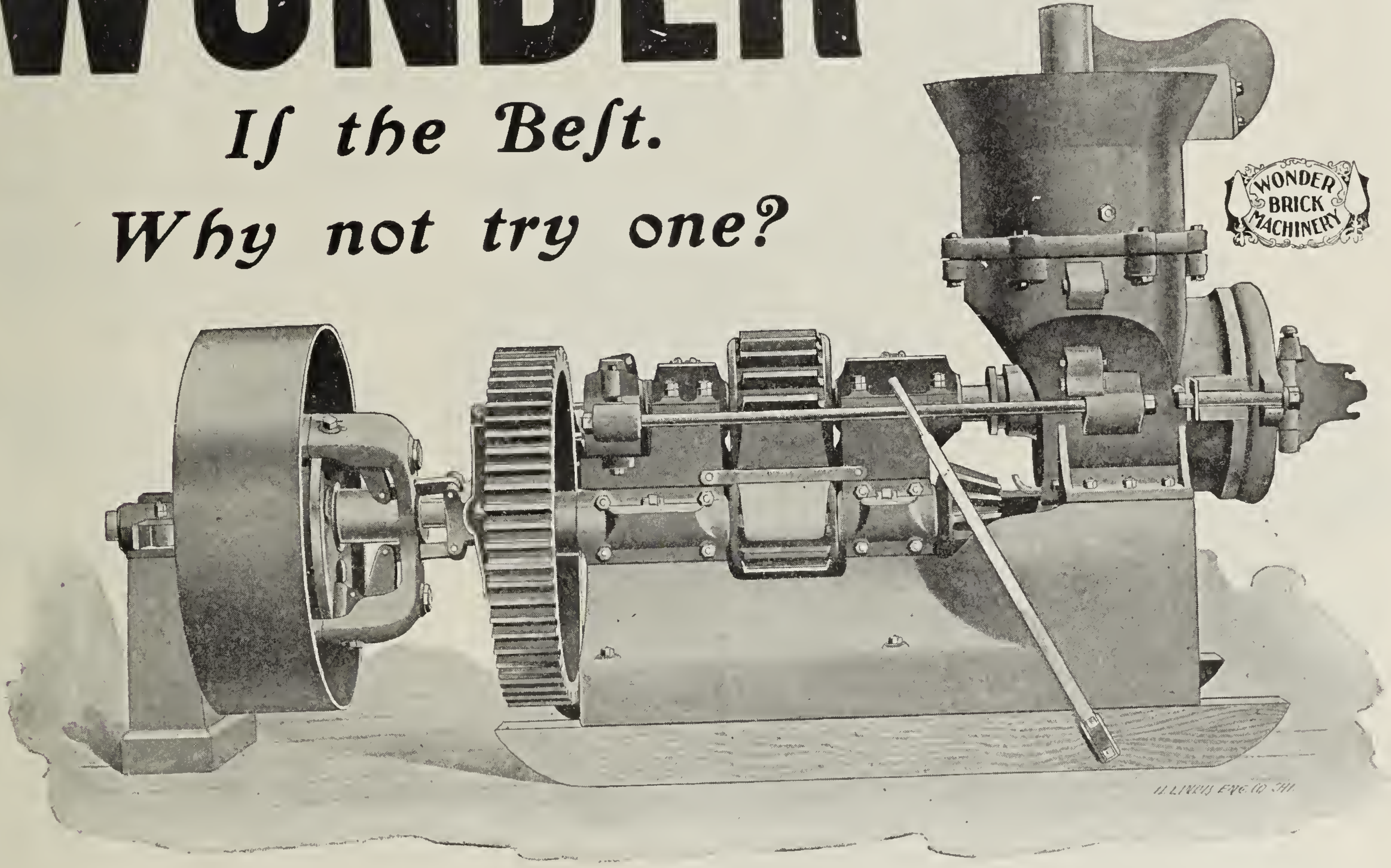

We Have the Best Roofing Tile Proposition ever offered to the trade.
Write Us: Let us tell you about it.

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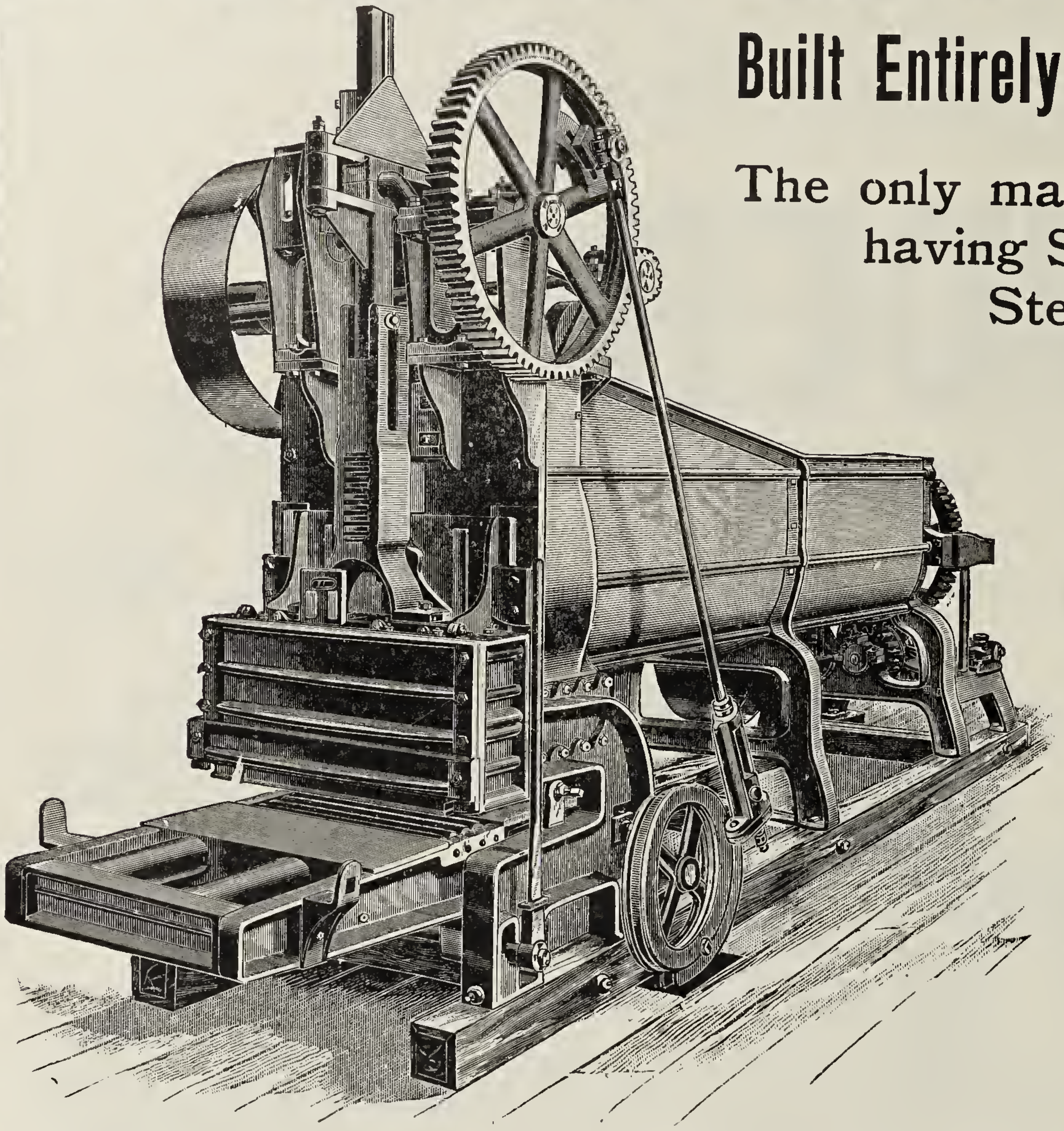
THE POTTS
HORIZONTAL BRICK MACHINE



Built Entirely of Iron and Steel.

The only machine of this class
having Steel Gear and
Steel Shaft.

Built of the Best
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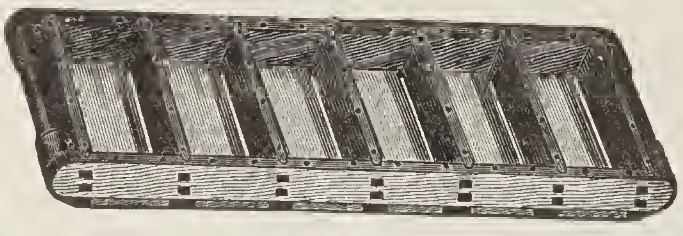
Workmen.

Simple, Strong and
Durable.

No extra pug mill required to enable working the clay direct from the bank. Its great strength enables working the clay as stiff as practicable, insuring brick which will be STRAIGHT and SQUARE.

THE LEADER OF ALL SAND MOULD MACHINES.



BRICK MOULDS A SPECIALTY

QUALITY IS OUR AIM.

We manufacture a complete line of Brick Yard Supplies. Write for prices.

C. & A. POTTS & CO., Indianapolis, Ind.

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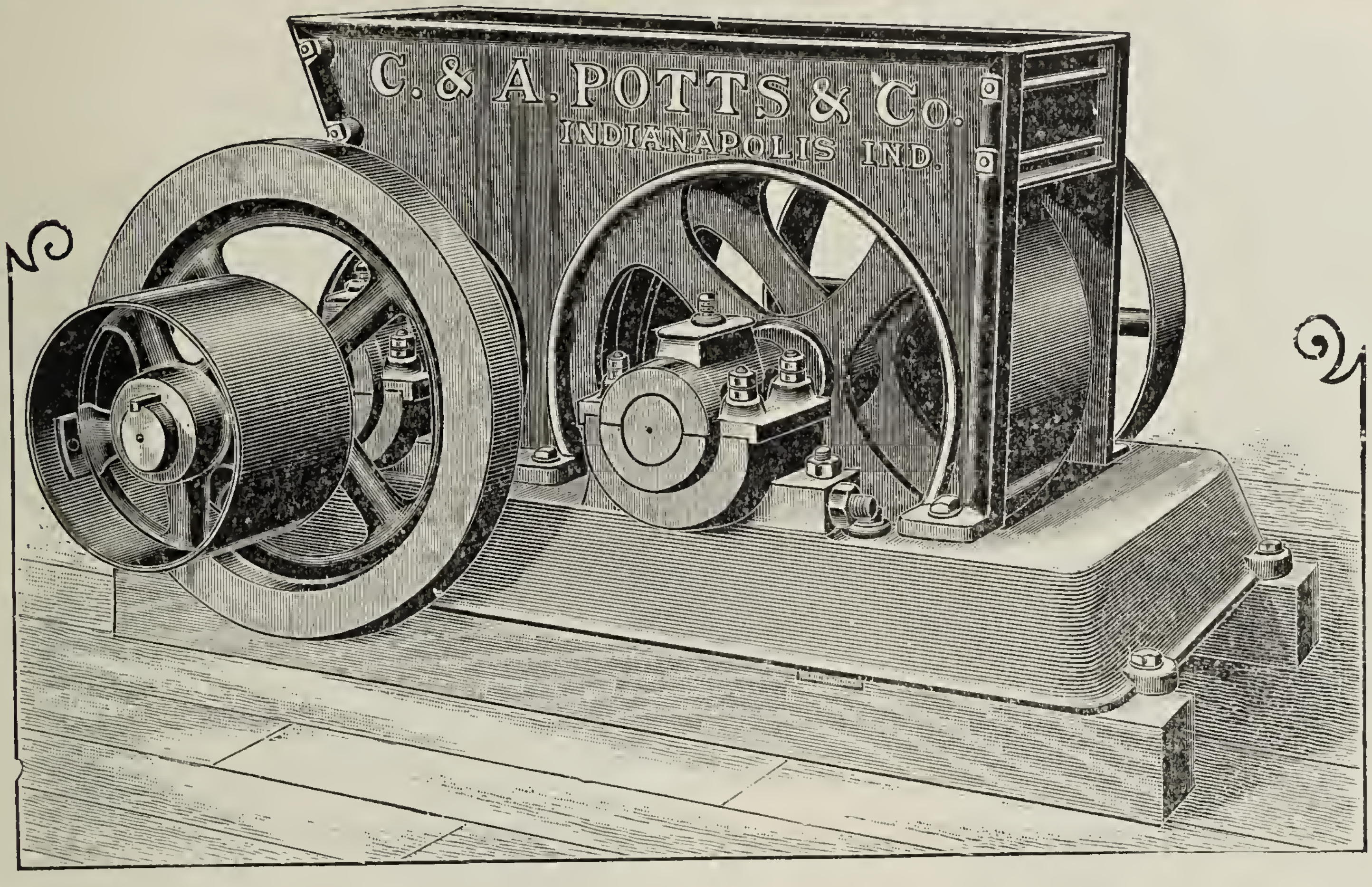

C. & A. POTTS & Co.
INDIANAPOLIS IND.

Is not a spite machine, but is built the best possible. Having Heavy Chilled Rolls, Ring Oiling Bearings, Shafts of Steel and large in Diameter. The most successful machine for grinding out sticky clays and separating the stone.

THE POTTS MOULD SANDER

Simple in Construction,

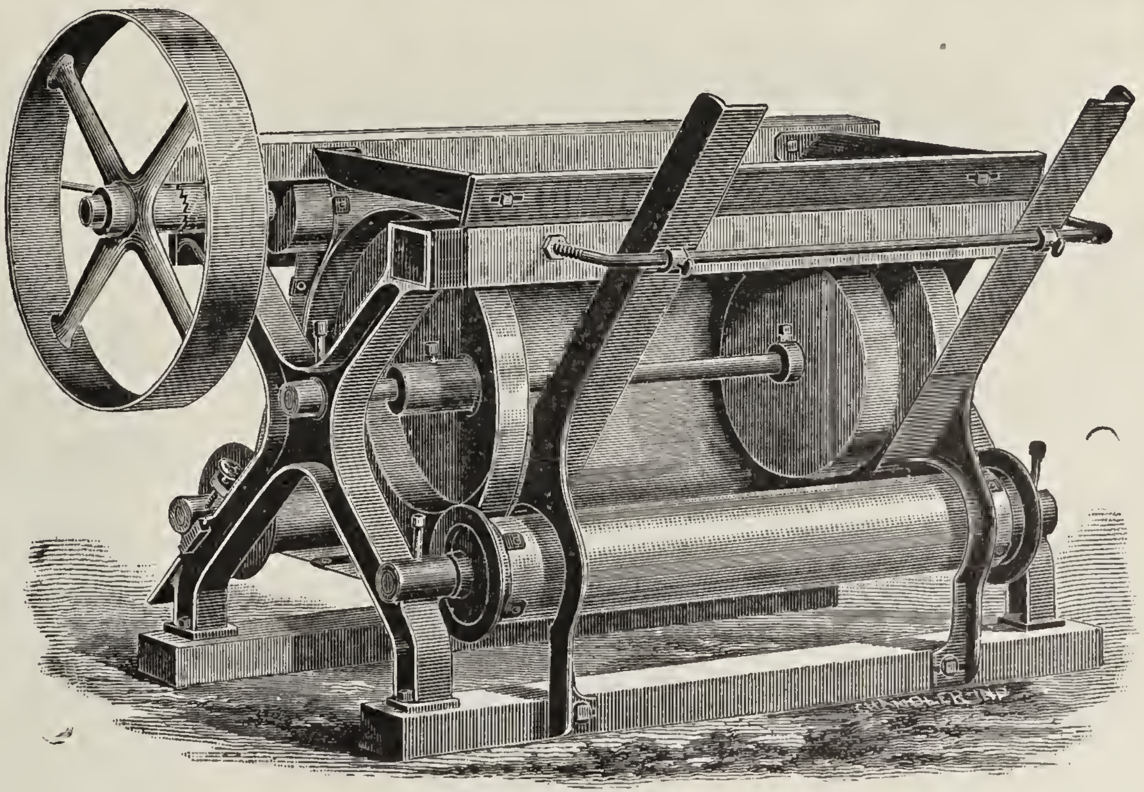
Strong and Durable,

Sands the Moulds Perfectly,

Never Strikes or gets Drunk,

Always Ready for Work,

No Brick Machine Complete without this Machine.



Patented February 5, 1889.

We make a specialty of equipping Sand Mould plants complete. We are the largest manufacturers of this class ot machinery in the world. Write for prices.

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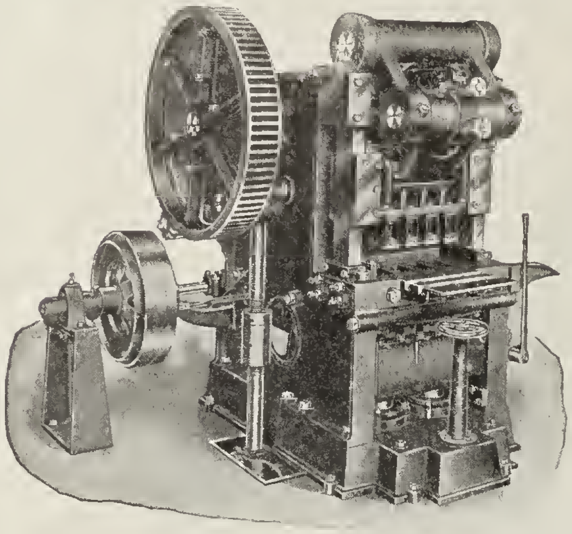
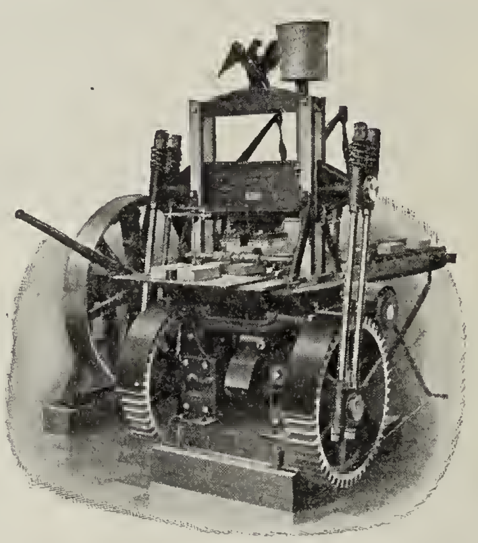
These are a few of the many Superior machines we manufacture for the Clay Trade. Large cuts



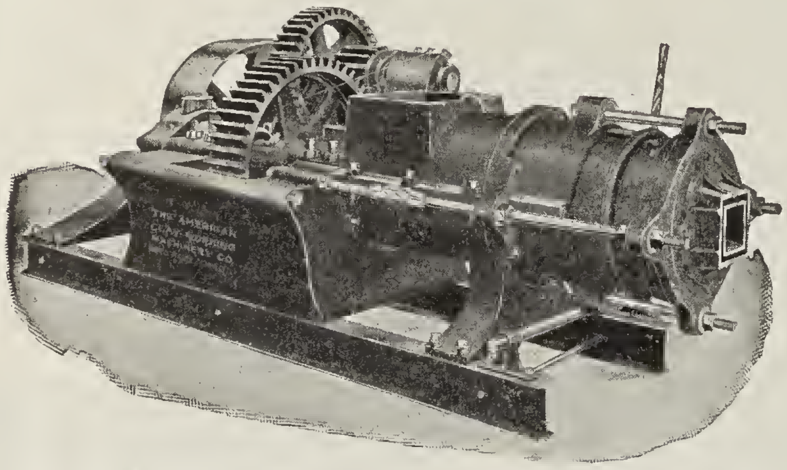
DRY PRESS BRICK MACHINERY.

We build a full line of Dry Press brick machinery. We have four styles and eight sizes, ranging in capacity from 1,000 to 3,000 brick per hour. This cut is our four mold, Moldel B press, especially adapted to Sand-Lime brick. Write for complete catalogue.

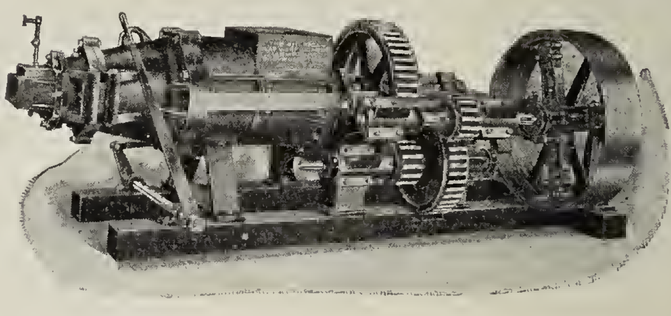


REPRESSES.

We build a large and complete line of represses in six sizes and styles. Capacity runs from 600 to 2,500 brick per hour. Send for our complete catalogue. This cut is of our double mold Eagle Repress.

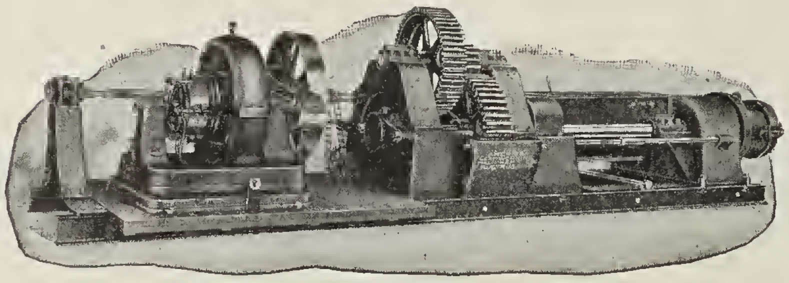


No. 40 AUGUR MACHINE FOR HOLLOW WARE.



No. 2 GIANT AUGER BRICK MACHINE.

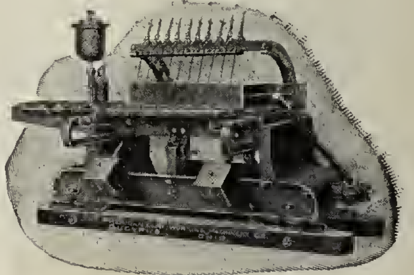
We build ten sizes and styles of Auger Machines. Capacities 1,500 to 10,000 brick per hour. Write for complete list.

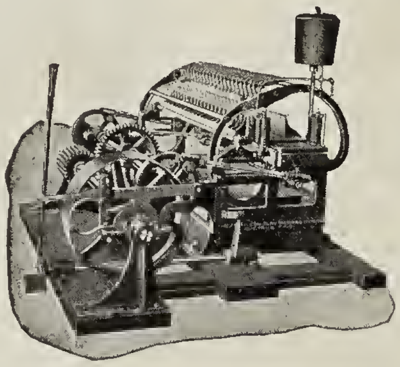


No. 23 ELECTRICAL DRIVEN, LOW FRAME, COMBINED MACHINE.

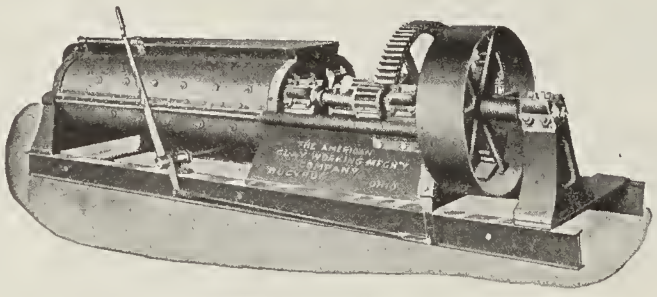
We make a full line of electrical driven clay-working machinery. Send for catalogue.

SEMI-AUTOMATIC AND HAND POWER CUTTERS





We make twenty-five styles of semi-automatic and hand power cutters for brick, tile and hollow ware. Write for full list and description.

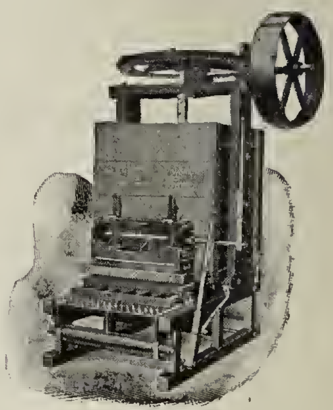


No. 38 DOUBLE SHAFT PUG MILL.

We build twenty different styles and sizes of pug mills to suit the needs of varying clays. Send for complete list and description.

SOFT MUD BRICK MACHINES.

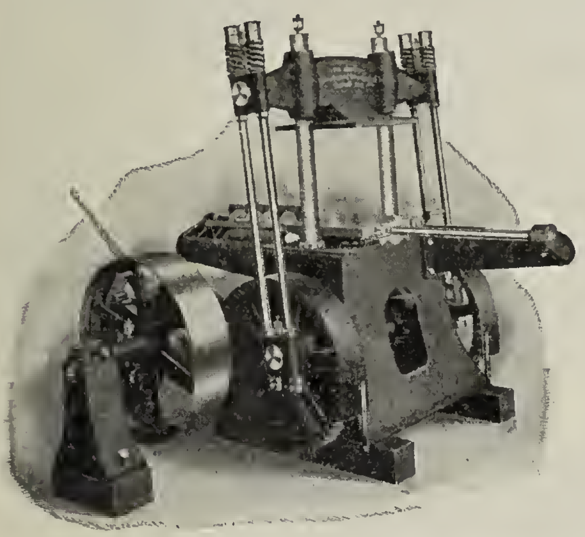
Our Eagle Steam and Horse Power Brick Machines are the best built for small capacity. They are complete with molds, etc. Write for our soft mud booklet. These machines are especially adapted for export.



Dry Press, Stiff Mud and Soft Mud Brick Machinery. Sand-Lime Brick Machinery, Cement, and Pottery Machinery. Waste Heat and Steam Dryers
Everything needed by the Clay Workers.

Company, Bucyrus, Ohio, U. S. A.

and full descriptions of these and a hundred other machines we make will be sent upon request.



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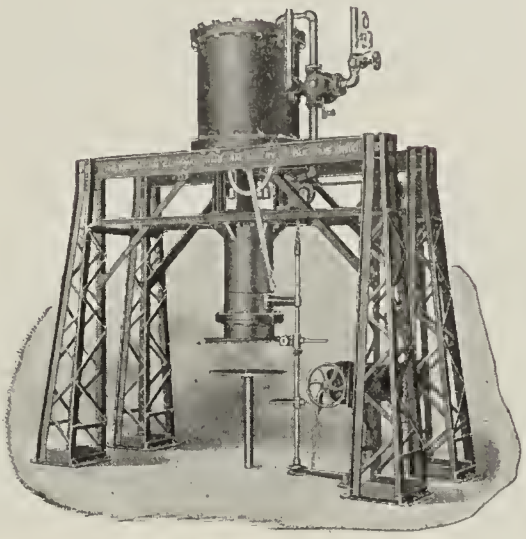
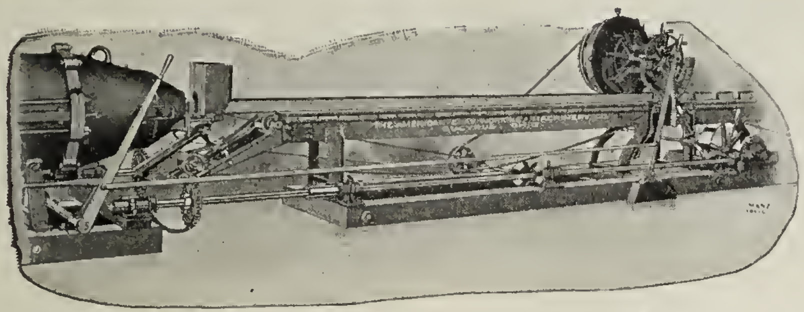


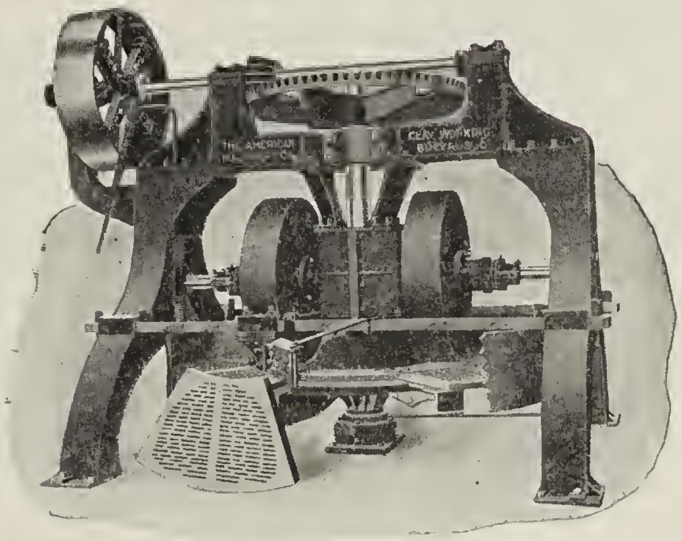
SEWER PIPE MACHINERY.

We build three styles of Sewer Pipe Presses, together with all appliances for a complete plant. Send for our big catalogue.



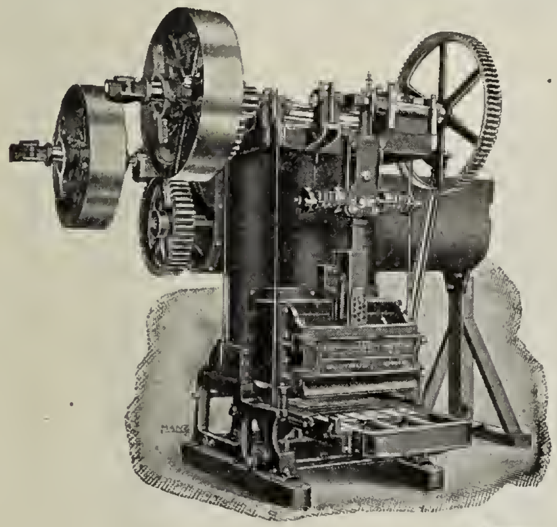
AUTOMATIC, END CUT, BRICK CUTTER, STYLE "P."

For end cut brick this machine is excellent. We build several styles of automatic cutting tables. Write for particulars.



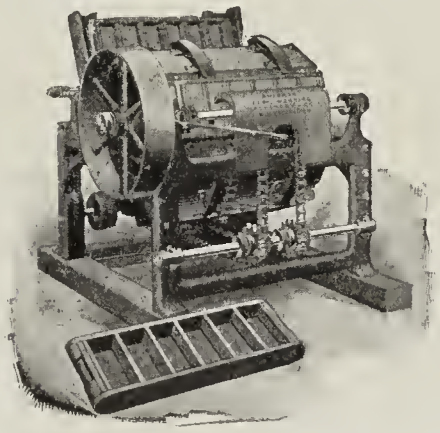
DRY AND WET PANS.

We build twenty styles of Dry and Wet Pans in varying capacity. They are all constructed of iron and steel and are most substantial. A complete description of the full line will be sent for the asking.



SAND MOLD BRICK MACHINE.

This machine is especially adapted for sand mold brick. It is an excellent machine. Write for a complete description.

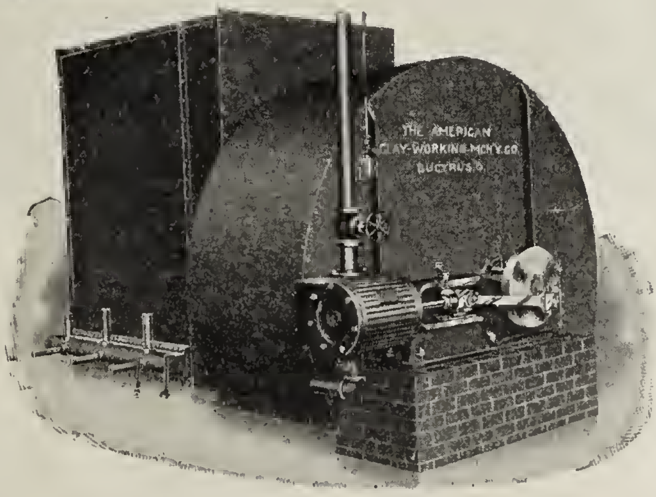


CHAMPION MOLD SANDER.

This is an excellent machine and sand molds evenly and economically. It is entirely automatic. Send for description.

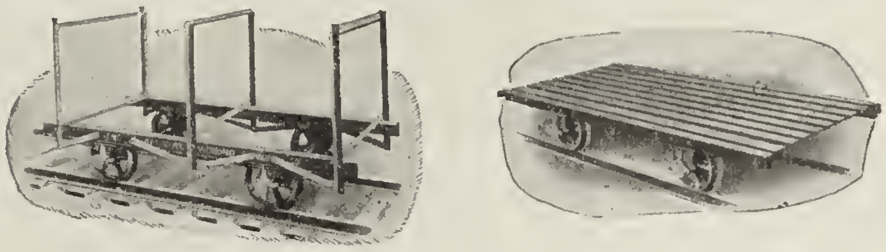
WASTE HEAT AND STEAM DRYERS.

We build both waste heat and steam dryers and can dry the most tender clay. Plans and estimates furnished upon application. We can dry your product at one-half the present cost or less. The cut is of our waste heat dryer outfit.


THE AMERICAN
CLAY-WORKING-MCHY.CO.
BUCYRUS, O.

OUR LINE OF CARS.

We build dry cars and clay dump cars in forty varieties. Send for car catalogue as it is sure to contain just what you want.



THE AMERICAN CLAY MACHINERY COMPANY

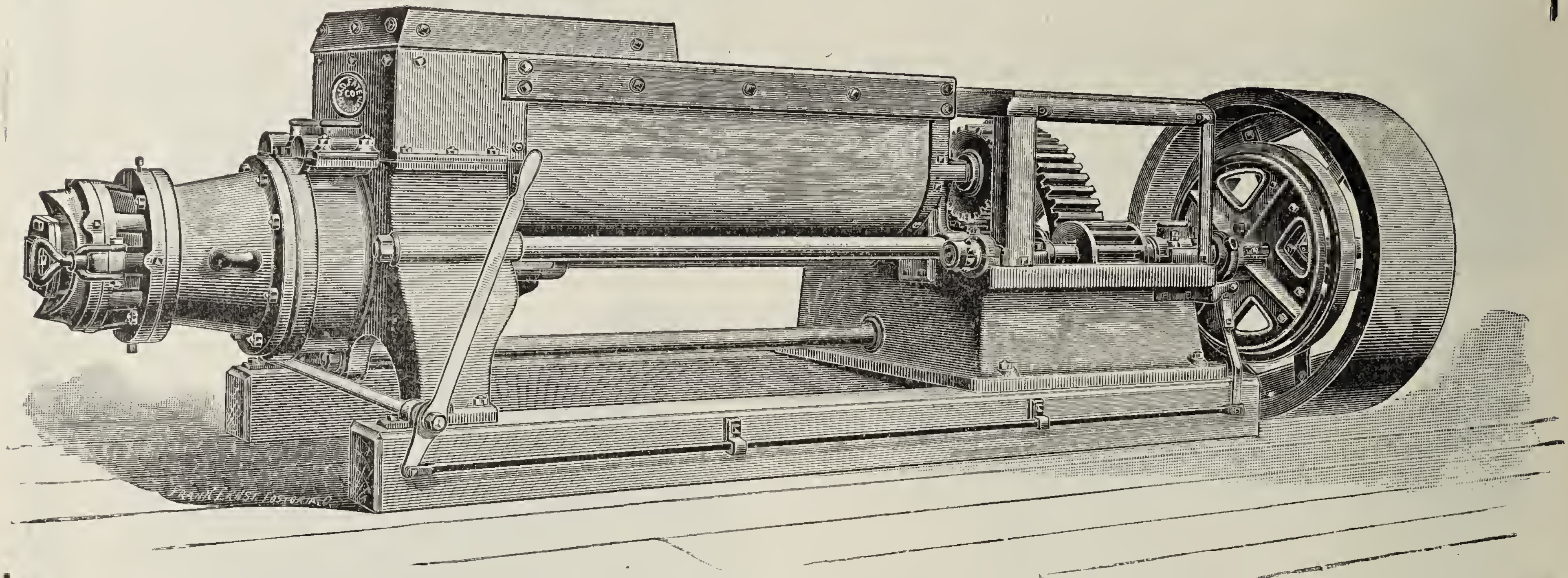
BUCYRUS, OHIO, U. S. A.

THE PREMIER LINE
THE J. D. FATE COMPANY

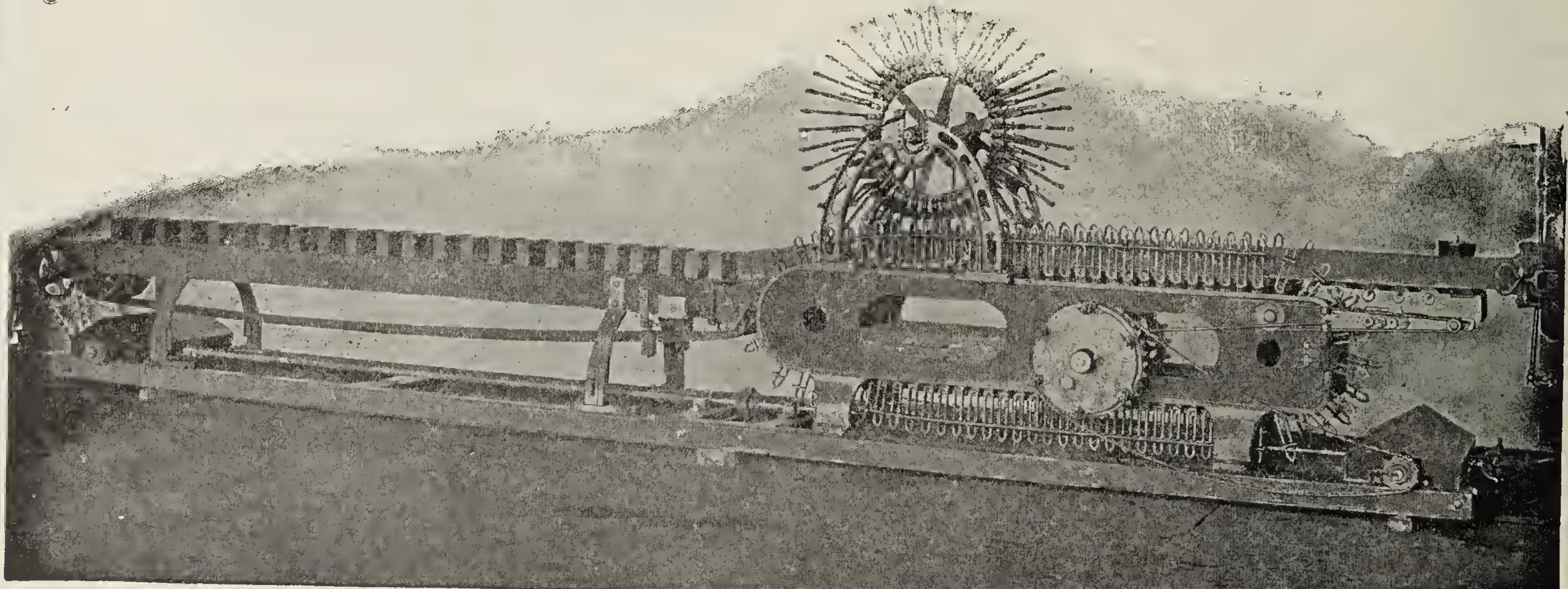
THE "PREMIER"

Combined Brick Machine

THE LARGEST LINE OF AUTOMATIC CUTTING TABLES IN THE WORLD



WITH BENSING'S AUTOMATIC SIDE-CUT BRICK TABLE.



Make a combination of Brick Machinery which is pronounced by practical brick makers to be the most perfect arrangement of stiff mud machinery now on the market.

It is unequaled for strength, durability, capacity and quality of ware produced.

Write us for catalog and full particulars of the "Premier" line of Clay Working Machinery.

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WESTERN REPRESENTATIVES:

B. E. LA DOW, 701 Dwight Bldg., Kansas City, Mo.

Pacific Coast: LEW THORNE, Grand Hotel, San Francisco, Cal.

CLAY RECORD

Vol. XXVI. No. 12. CHICAGO, JUNE 30, 1905. Semi-Monthly, $1.00 per Year
Single Copies, - 10 Cents

"ARE GAS-FIRING KILNS FOR BURNING FIRE-BRICK ECONOMICAL?"*

By P. L. Youngren, Milwaukee, Wis.

The combustion of any fuel existing in a solid or liquid state is always preceded by a gastification stage which may be considered the primary stage of combustion, and is accompanied by the absorption of heat. The second stage occurs when the vaporized fuel is brought in contact with oxygen at a temperature sufficiently high to cause ignition, then a chemical action takes place which is accompanied by the generation heat.

When the vaporization of the fuel and its subsequent chemical combination with oxygen is accomplished in the same chamber or furnace we term the process "direct" or "grate-firing," and when the gasification of the fuel takes place in one chamber and its final combustion takes place in another chamber more or less remote from the place of gasification the process is termed gas-firing.

Through lack of definite knowledge on the subject some persons imagine that the latter process, in some mysterious manner, adds to the actual heat energy of the fuel, forgetful of the dominant fact that we are absolutely unable to create any energy in any form. On the contrary, the conversion of the solid or liquid fuel into a gaseous state actually involves the loss of effective energy and the reason why we are enabled to derive more duty from a fuel treated in this manner is due to the fact that it enables us to use it under conditions more favorable to the development of its full heat energy than it would be possible to obtain in direct or "grate-firing."

Before proceeding with the discussion of the application of gas for kiln firing, it will perhaps be appropriate to touch briefly on the sources and relative value of the different fuel gases at our command.

The gas that ranks highest in the list of fuel gases is the one made in nature's producer, the natural gas, which possesses greater calorific power per unit than any of the artificial gases, but as the known sources of supply of this valuable gas are limited to small areas of territory, and as the supply even there is gradually diminishing we must look for more staple sources of gas supply for the future.

Among the artificially made gases the ordinary coal gas or illuminating gas ranks next to the natural gas in fuel value per unit, but as it is produced by the expensive process of distillation of bituminous coal in closed retorts, yielding a by-product of coke, its manufacture is too expensive to permit its use for industrial purposes on a large scale.

After the illuminating gas, in heat value per unit, comes the water gas (Co-H), so called because it is derived by passing steam through a bed of incandescent carbon resulting in the combination of the oxygen of the water with the carbon and the liberation of the hydrogen, the resultant gas being carbon monoxide and hydrogen which possesses about one-half as much heat energy per unit as the illuminating gas, but, on account of its production being necessarily intermittent and entailing a considerable loss to the original fuel by the alternating blasts of air through the coke to bring it to the necessary incandescent state, the production of this gas is found to be too expensive for general application.

Last, but not least on the list of fuel gases comes the producer gas which is the result of partial combustion of solid fuel in a producer or generator. It is composed principally of carbon monoxide, hydrogen, hydro carbon and nitrogen when derived from bituminous coal. The presence of a very large percent of nitrogen, usually between 50 and 60 per cent, makes this the weakest of all the fuel gases, relative to volume, but nevertheless, it is by far the cheapest gas made per unit of heat carried and contains more of the heat energy of the coal from which it is derived than any of the above mentioned artificial gases because the entire mass of the coal, except the ash, being converted into gas.

Despite its relative weakness this gas is now almost exclusively used for producing the high temperatures required in the steel mills, melting furnaces, glass works, etc., and its field of application is constantly enlarging.

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*Read at the last meeting of the N. B. M. A. at Birmingham, Alabama.

The brickmakers, however, have been very slow in grasping the many advantages that are derived from its use for kiln firing, this being undoubtedly due to a lack of knowledge of the proper application.

Any attempt to use this gas in the same manner as the vastly more powerful natural gas, would of course result in a miserable failure, and according to some experiences related in one of the clay journals some time ago, I would infer that this very thing had been tried, and, failing to accomplish the desired results, the fact was heralded broadcast over the land from ocean to ocean, warning fellow brickmakers to steer clear of anything in the form of producer gas for kiln firing. All of this could have been dispensed with had the parties studied the problem thoroughly and applied the gas properly.

The relative weakness of the gas precludes its use for high temperatures except in combination with preheated air, but when used with preheated air the highest temperature required in the steel industries are rapidly attained.

The preheating of the air is generally accomplished in regenerators, reversible or continuous, in which the waste gases passing from the furnace are caused to impart their heat to the air passing into the furnace or combustion chamber.

The expense connected with equipping individual brick kilns with regenerators, considered in connection with the intermittent operation of the kiln, would in my estimation, make it a doubtful investment from a commercial point of view, whether the kiln is to be used for burning fire-brick or any other class of clay goods.

A much more satisfactory solution of this problem presents itself in the use of the progressive or continuous system of kilns; in fact the opportunities here are the most ideal imaginable for the proper application of producer gas. Without any regenerators or reversible drafts there is a constant flow of hot air coming from the hot finished brick in one kiln and passing directly into the combustion chambers of the burning kiln, where it is mingled with the gas in a suitable manner. The general arrangement of kilns and necessary flues being susceptible of very simple and durable construction.

The producer used may be either of the steam blast or natural draft type. The actual amount of heat derived from a given amount of coal being precisely the same in both cases, but with the steam blast the resultant gas is somewhat stronger, due to the smaller per cent of nitrogen carried through the fuel and is consequently less in quantity. From the fact that the steam blast producer requires more intelligent attention than the natural draft or suction producer and from the further fact that under the extremely favorable conditions for the proper application of the gas that are always present in the continuous kiln, I favor the natural draft producer for kiln firing. The highest temperatures required for burning fire-brick being easily maintained.

The principle advantages derived from the application of producer gas to kiln firing in the above manner, based upon actual experience, may be briefly stated as follows:

First. The saving of 75 per cent of fuel as compared with ordinary furnace-fired kiln of ordinary type.

Second. Simplicity in operation. The temperature in the kiln can be carried more uniformly and with greater accuracy than it can be done with grate firing and is not nearly so dependent upon the eternal vigilance of the fireman.

Third. The coal is always delivered at one place instead of being carried all around the kilns as the case is in furnace firing. In large units mechanical means for handling the coal may be employed to advantage.

VALUABLE INFORMATION WORTH SAVING.

Diameter multiplied by 3.1416=circumference.

Circumference multiplied by .3183=diameter.

Radius multiplied by 6.2831=circumference.

Square of the diameter multiplied by .7854=area.

Diameter multiplied by .8862=side of equal square.

Area of a rectangle=length multiplied by breadth.

Doubling the diameter of a circle increases its area four times.

Side of a square multiplied by 1.128=diameter of circle of equal area.

Surface of a sphere=square of diameter multiplied by 3.1416.

Area of a triangle=base multiplied by ½ the altitude.

Area of a sector of a circle=one-half the length of the arc multiplied by the radius of the circle.

One cubic foot of water weighs 62 1-3 pounds and contains 7½ gallons.

One gallon of water (U. S. Standard) weighs 8 1-3 pounds.

To find the capacity (U. S. gallons) of cylindrical tanks, square the diameter expressed in inches, multiply by the length and by .0034.

The pressure of still water in pounds per square inch against the sides of any pipe, channel or vessel of any shape whatever is due solely to the "head" or height of the level surface of the water above the point at which the pressure is considered, and is equal to .43302 lb. per square inch or 62.355 lbs. per square foot for every foot of head.

Boiler Horse Power: The evaporation of 30 lbs. of water per hour, from a temperature of 100° F. into steam at 70 lbs. gauge pressure.

One pound of water evaporated from and at 212° is equivalent to 965.7 British Thermal Units.

To find the number of square feet of heating surface in tubes: Multiply the number of tubes by the diameter of a tube in inches, by its length in feet, and by .2618.

To find safe working pressure of boiler: Multiply 1-6 of tensile strength of plate by the thickness of the thinnest plate in inches and divide by ½ the diameter of the boiler. This is for single riveting, to which add twenty per cent for double riveting when all the holes have been drilled.

$21.35 TO ASBURY PARK, N. J.

and return, via Nickel Plate Road. Tickets good via New York City. Dates of sale, June 29th and 30th and July 1st and 2nd, with extreme return limit of August 31st, by depositing ticket Chicago City Ticket Offices, 111 Adams St. and Auditorium Annex. Depot, La Salle and Van Buren Sts., on Elevated Loop.

ONE REASON FOR "POOR HOLLOW CONCRETE BUILDING BLOCKS."

The philosophy of making good artificial stone by hand and even better than can be done by hydraulic pressure is very simple, but from such information as can be gleaned from the advertisements of hollow block machines is little understood, and to this may be attributed much of the trouble in question about damp houses when plastered directly upon the walls.

This is only one of many faults which are coming to light as the novice gets in his work, but in justice to the industry it is perhaps best to inform the public that if it employs incompetent workmen who use still more incompetent machines, they must always expect trouble from one source or another, and it must also be understood, that experts, as a rule, are not anxious to divulge all the points which they have learned by long experience, and when some "three or four years old" begins to elaborate on what he knows about artificial stone or building with hollow blocks, it is well to shun him as well as his theories.

But the fact is recognized that tamped stone is the best if it has been properly done, and obviates many serious difficulties otherwise unavoidable; but, all tamped stone are not alike and some are worthless, so that proper rules must be observed at all stages of the process. One in particular is very essential and this one I will explain:

To begin with, the mixture must be exactly right in all details, which cannot be taken up in this article; but, special attention is called to its consistency at the time it is put into the mold. As in illustration, take the painter applying gold-leaf. He does not work haphazard by putting on the varnish and then the leaf. See how he carefully watches for the right consistency of the varnish as it dries so as to properly hold the gilding. Just so with the best operators in artificial stone. The mixture must be right and in addition the mechanical means must be correct. The disideratum in this respect is the ability to compact the mass into the smallest space possible and *hold it there.* The ramming of the mixture in an open box or mold cannot give that density which is necessary for water-proof work. This can be illustrated by the manner in which sidewalks are tamped, and the only way to make water-proof work in such cases is to add enough cement, which is prohibitive by the additional cost.

Every one knows the power contained in the well-known principle of the wedge, and the best results in compacting the artificial stone mass is on this same principle, and to accomplish this the mold must be the smallest in the bottom; the walls somewhat inclined and not too far apart.

Taking for granted that the mixture is in just the right stage to retain its position under the repeated blows of the rammer, it is shoveled into the mold and pounded down between its inclined walls which grasp the material like a vise, each blow adding to that already given and retained, in connection with the sticky condition of the right mixture compacts the mass to the smallest degree and the density, strength, porosity and lasting qualities of the stone thus produced are greatly enhanced as well as a more even and uniform color with less liability to efflorescence and cracking.

A stone made in a mold, whose walls are twelve inches apart, cannot be compacted to that degree of the one with walls only three inches apart and properly inclined. It was this favorable feature which aided very materially in making hollow blocks a success; because, when the cores were in position the thickness of the walls of the stone would be the most advantageous in ramming. This, in addition to the tapering cores produced the wedge shaped mold and the ideal conditions for perfect stone. It is this principle why better impressions are given to the stone by the *sides* of the mold than can be obtained from the bottom. With these features all properly combined there is no reason in the world for this great commotion in all the papers about damp buildings, efflorescense and the thousand and one troubles which people are clamoring about without the knowledge or adaptability of the business.

Of course, with the best machinery many will make failures at first, and with the poorest machines some will get comparatively good results; but, it is greatly to be desired, as far as the industry goes, that nothing but the best should be put out and the proper instructions given for the purpose of education. There is no reason for poor stone and poor buildings, and in time this kind of work will not be tolerated by the public any more than it is at the present time by those who know what good work should be.

Now, look at the shape of a good many of the machines advertised for making building blocks and some time exploited by reading notices. Some of them are actually the largest in the bottom of the mold, especially those whose cores are drawn from the top, destroying entirely all possibility of obtaining the benefits which would result with the core reversed. In many others the walls are the same distance apart at top and bottom and in the so-called "face down" machines there is no core at all when the tamping begins, and even this improper tamping is again disturbed by shoving the cores into the mold at the side after the same has been partly filled, ignoring altogether one of the most important principles of correct stone making to the detriment of good work and the proper advancement of the industry.

Of course, they get stone; they put up buildings which in some cases are acceptable; but, how many are not acceptable? Is it any wonder that we are beset with importunities and vexing questions and that our rivals in other material are laughing at the mistakes of incompetents, who failing to draw a distinction between those who do and those who do not know their business are retarding the growth of an industry that is in time to supercede to a very great measure all other building material for general construction?

H. S. PALMER.

FOURTH OF JULY.

Tickets will be sold at one fare for the round-trip, plus twenty-five cents, from Chicago, July 1st, 2nd, 3rd and 4th, to any point on the Nickel Plate Road. Return limit July 5th. Chicago Depot, LaSalle and Van Buren Sts. City Ticket Offices, 111 Adams St. and Auditorium Annex. Telephones Central 2057 and 6173 and Harrison 2206.

STORY OF THE ROOKWOOD POTTERY, THE MOST FAMOUS IN THE WORLD.

Rookwood Pottery does not care whether it makes money or not, and that is the reason it is a paying institution.

Its whole mission has been to keep up the standard in art and to do that it has made many sacrifices. Rookwood believes that art suffers when profit is a consideration. But in spite of Rookwood's utter disregard for profits, it has for years been more than self-sustaining.

Mrs. Maria Longworth Storer, daughter of a Cincinnati multi-millionaire, and now the wife of Ambassador Storer, conceived and created Rookwood. The painting-on-china craze in Europe in 1874 extended to America, and Mrs. Storer, then Miss Longworth, took it up. In 1875 she received from London some little Japanese books for designs.

World-famed Rookwood of Cincinnati was the result.

To use Mrs. Storer's own words:

"This was almost my first acquaintance with Japanese art of the imaginative and suggestive kind. It prepared me for the wonderful beauty of the Japanese exhibit at the Philadelphia centennial. It was there that I first felt a desire to have a place of my own, where things could be made and I wanted to import a complete Japanese pottery, workmen and all. My father laughed at the impracticability of the undertaking when I proposed it to him, but the idea of my making pottery interested him."

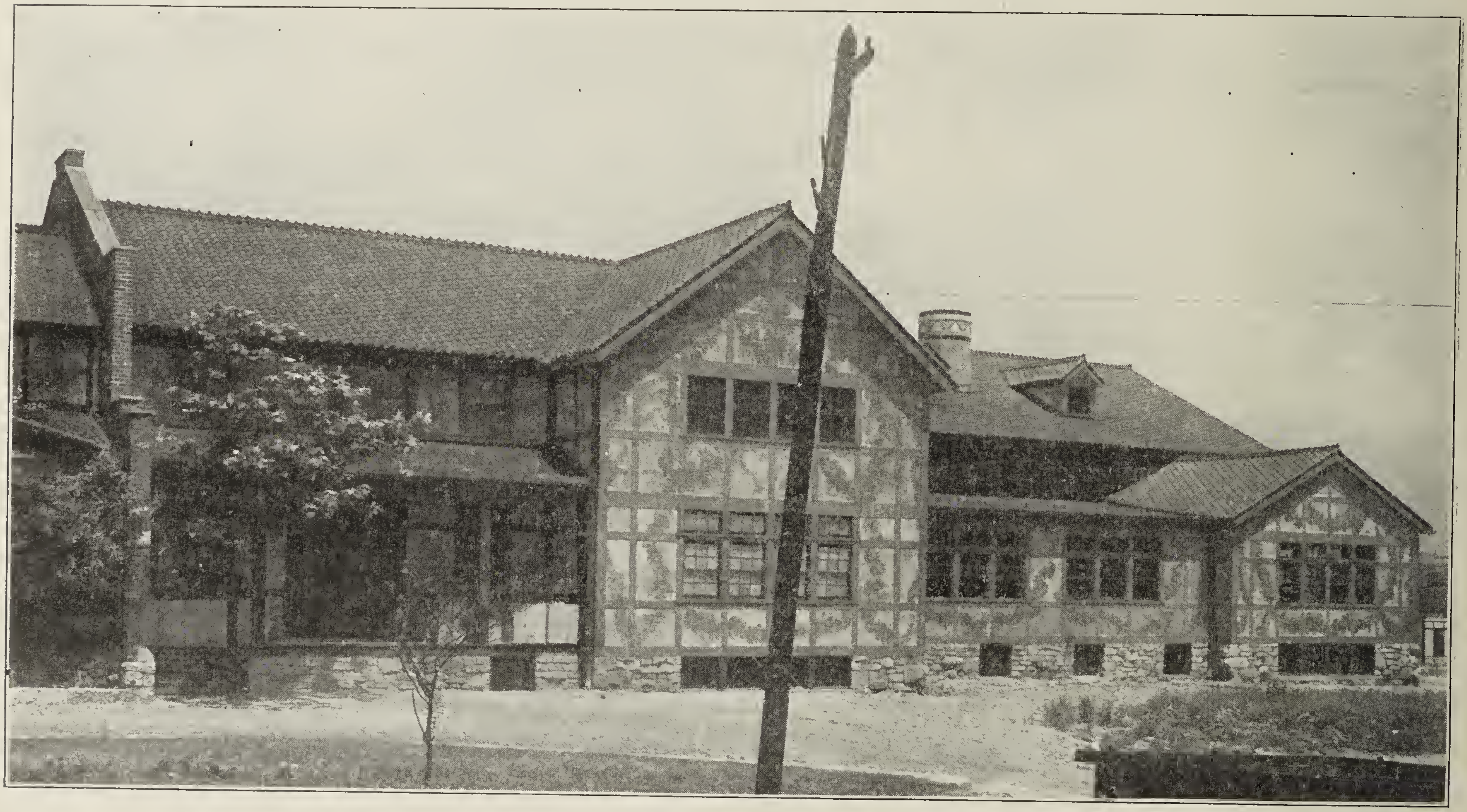
Such was Rookwood's inception. A woman's genius, patience and persistency. The first kiln was drawn in 1880, in an old school house, which Mrs. Storer's father bought at a sheriff's sale. Ten years later the present magnificent Rookwood allowed Mrs. Storer to realize the dream of her life.

Mrs. Storer said recently: "The object was to make beautiful things out of the simplest materials. These materials are earthenware clay and the colors which can stand an underglaze heat, that is, that can be painted upon the unbaked clay of which the vase is made, and then go through the fire necessary to vitrify earthenware."

Mrs. Storer secured the Japanese, K. Shirayamadani, and he is still the one foreign artist at Rookwood, there being from 30 to 35 others, all trained at the Art Academy, of Cincinnati. Rookwood became famous in Europe before it did in America. It made its bow to Europe in 1889, at the Paris exposition. Four years later it made its bow to America at the world's fair at Chicago. To-day the institution has agents in Australia, China, Japan and all over Europe, and there is no part of the civilized world that Rookwood ware does not reach. Rookwood employs 60 people throughout the year. It is one of the few vast institutions of the world that are not conducted on a commercial basis. In speaking of this and when asked of the quantity of the output, President Taylor said:

"Quantity, I don't know and I don't care. Quality—That is the starting point and the ending point at Rookwood."

Every piece of pottery that leaves Rookwood bears the initials of its creator, the artist. Of the thousands of pieces of beautiful and costly pottery that Rookwood has turned out it has never produced two designs alike and never will. Each piece has an individuality that it forever possesses. Be-



View of a Portion of the Front of the Rookwood Pottery at Cincinnati, O.

cause the artist's initials are on the piece he takes great pains with his creation. It may enter some famous art museum abroad, or it may become an ornament in some castle of royalty.

Rookwood has the most astonishing range in the world. Famous old potteries of Paris, Berlin, Dresden and other places have a limited number of types. In those places if a piece of pottery is produced that excites more than usual admiration, it is duplicated as often as the demand requires. But the rule against duplication at Rookwood has never been broken. Numerous delicate tints have been discovered by Rookwood artists that have produced a craze in the old world—dark green, claret brown, a light blue, a delicate tone of dull blue green, a sea-green and the exquisite "Iris," a gray-blue with undertones of pink and green, which is a creation and a triumph of Rookwood.

In the handling of the native clay by the artists, numerous accidents of color have occurred, and at once have been taken advantage of. Then, any fresh leaf or flower that contains beautiful formations of nature is carried to Rookwood and reproduced in design beautiful by the natural hue. Animals, birds, insects, fish, landscapes, flowers, fruit and like designs make up limitless source of supply.

The decorators include both men and women. The decorations are entirely on the moist clay before any firing, the colors being mixed with clay and becoming part of the ware itself. The pieces, after decoration, are fired into biscuit, and the various glazings are applied in subsequent firings. These methods are necessary to produce the famous underglaze effects of Rookwood ware. They are rarely used elsewhere because of the expense.

The clays used are entirely American, largely from the Ohio Valley. This native clay contributes not a little to the brilliancy and mellow tone that characterizes all the products of Rookwood. The famous "Tiger Eye" was created at Rookwood in 1884. This was the earliest of the crystalline glazes that have since been crazes of Sevres, Copenhagen and Berlin. But they are imitations and none has ever attained the brilliancy of the Rookwood ware.

BIG LAND DEAL NEAR PORTSMOUTH FOR CEMENT AND BRICK PURPOSES.

The papers and abstracts for one of the largest land deals ever made in Southern Ohio have been made out, and if approved, the deal will be formally consummated.

It involves from 25,000 to 30,000 acres of land in the eastern part of the county, which is situated near Howard's Furnace and Upper Pine Creek.

It is understood that it is to bring $50 per acre, bringing the consideration up to the immense figures of $1,500,000.

The land is owned by Capt. Skelton, of New Boston, Peter Andre, Charles Turner, Mr. Burcham, Howard Rodgers and the McGugin Iron and Coal Co.

It is rumored that the real purchaser is the C. H. & D. Railway Co. The attorneys of the company are expected in the city Saturday and the deal may be closed then.

It is understood that if the C. H. & D. secures control of the land they will erect several cement and brick plants.

ANOTHER TEST OF SAND-LIME BRICK.

Moline (Ill.) sandstone brick, manufactured by the Tri-City Sandstone Brick Company, is superior to anything that has ever been put on the market, according to a report made by Robert W. Hunt & Co., engineers, and a firm conducting a bureau of inspection, tests and consultations.

There has been considerable comment as to what kind of brick would be preferable to use in the new opera house building, and although there has been much opposition to using the local brick, some claiming that the Chicago brick is better, it seems to be the sentiment of those who subscribed money for the new opera house to use the Moline brick.

Ever since the foundation was completed, Architect Borgolte has been unwilling to use the Moline brick until satisfied that it is as good as the Chicago brick. At a recent meeting of the Moline Business Men's Association the use of the Moline brick was indorsed on every hand; all seem to want that brick. To satisfy everybody concerned, E. E. Morgan sent several samples of the Moline brick from a pile near the factory and sent them to the above named company for a test. This test has not only shown that Moline brick is of a first-class nature, but that it is above the standard brick. Although the local promoters of the brick knew that the brick was a good one, they did not expect that it would receive such an unusual recommendation.

By way of comparison a test was made of the Saginaw brick, which is made the same way as the Moline brick, and while the Saginaw stood a test of 98,250 maximum load in pounds, the Moline brick stood a maximum load in pounds of 152,780. The Saginaw brick withstood a pressure of 2,977 pounds per square inch to 4,720 pounds per square inch for the Moline brick.

Here is the report made by the Robert W. Hunt Co.:

Gentlemen: Below please find report of crushing, absorption and frost test on the samples of brick submitted by you.

Brick marked No. 3 made out of river sand:
Size 8.22 inches by 3.94 inches.
Area, 32.29 square inches.
Maximum load, in pounds, 152,870.
Pounds per square inch, 4,720.

Brick marked No. 5 made out of mound sand.
Size, 8.21 inches by 3.97 inches.
Area, 32.59 square inches.
Maximum load in pounds, 68,530.
Pounds per square inch, 2,100.

Samples marked 1 and 2 were cut in two pieces, one piece of each sample was subjected to a frost test with excellent results, showing no sign of disintegration or cracking.

The other piece of each sample was subjected to an absorption test, with the following results:

Brick marked No. 1, 10.07 per cent.
Brick marked No. 2, 9.37 per cent.

Respectfully submitted,
Robert W. Hunt & Co.

W. A. Kingsley, general manager and treasurer of the General Fire Proofing Co., Youngstown, O., has tendered his resignation to the president of the company to take place at once.

GLASS PAVING AND BUILDING BRICK.

RUSSIA.

Glass bricks adapted exclusively for paving purposes, so-called "prisms," are produced by the Russian firm "Actiengesellschaft Zombkowiczer Glasfabriken" in its factories situated at Zombkowice, Polland. The article is manufactured, pressed and uncut, from ordinary pellucid glass metal, in the form of oblongs adjustable by means of iron frames. As coverings for light shafts, etc., they are considered to answer the purpose just as well as the article manufactured by the "Luxfer Prism Syndicate," the introduction of which has also been tried here, but as yet without any success worth mentioning.

Another kind of brick of glass manufactured according to the "Systeme Falconier," of which the Warsaw firm Steck is the general representative for Russia, is produced in Kielce, Poland. These bricks, made of green blown glass and hollow, are mostly utilized for the construction of windows, partitions, etc. The cases in which they have been employed in these provinces are as yet too few to allow conclusions to be drawn with regard to their practical value.

CHR. SCHULIN, *Vice and Deputy Consul, at Piga.*

SPAIN

The only manufacture of paving bricks from glass in Spain is that recently established at San Sebastian, in the province of Guipuzcoa, where a stock company with an authorized capital of 5,000,000 pesetas ($750,000) has been formed under the name of the "Sociedad Espanola de Piedra Vidrio y de Construcciones Garchey" (the Spanish Glass Stone and Garchey Construction Company). As its name implies, the company will work the Garchey patents. Important works are in course of erection at the little seaport town of Pasages, and sanguine hopes are entertained that a large demand will speedily grow up in this country for these bricks, owing to the many purposes for which they can be utilized and the evident advantages they offer.

The devitrification of glass whereby its transparency and brittleness are replaced by an opaque appearance and a hardness resembling granite, is no new discovery. Many eminent French scientists had succeeded in devitrifying glass, but they have failed to find a practical process whereby a marketable value could be given to the product.

Mr. Garchey has discovered a system for thus altering the molecular structure of glass which enables him to offer a new product to builders, the practical value of which can hardly be overestimated. In appearance it resembles granite with a variety of tones of color, these depending on the nature of the metallic oxides contained in the materials used in its composition, or which may be purposely added in the process of manufacture. It retains all the qualities of ordinary glass, in so far as to be unaffected by acids, being, therefore, particularly suitable for the floors and walls of hospitals, operating rooms, chemical laboratories, etc., as also for slaughterhouses, or even stables.

It is further claimed that these glass bricks do not absorb moisture, being nonporous, and that therefore they form the most hygenic material known for paving the streets of large cities. Their hardness is greater than that of any kind of stone used in building, tests showing that it required a pressure of close to 29,000 pounds to the square inch to break the material, or 22 blows from a weight of 9½ pounds falling from a height of 39 inches.

The special features mentioned also give the bricks a great resistance to wear and tear, as may be seen from the report of the laboratory of the army corps of engineers, a copy of which I append. In this report a comparison is made between Garchey glass stone and Carrara marble, it being found that the former is fifteen times harder than the marble. It might be feared from the fact that these bricks are made from glass that they would be too slippery for street pavements, but it is stated that their rough, corrugated surface makes them no more slippery than any other paving stones.

Finally, the manufacturers of these glass bricks claim that they are absolutely unaffected by rapid changes in temperature; that they are nonconductors of heat, and therefore particularly adapted for building purposes; and that for electric-generating stations and other electric purposes no better insulating material can be found than Garchey glass stone, which can resist a tension of 60,000 volts.

Five glass works in France and one in England are now making Garchey glass stone, and negotiations are in progress for working the patent in Russia, Austria-Hungary, and Roumania.

JULIUS G. LAY, *Consul-General, Barcelona.*

SPANISH ARMY CORPS TEST.

1. Structural remarks: The samples present a very marked vitreous appearance, homogeneous greenish-color, and compact texture; free from extraneous bodies and bubbles.

2. Determination of specific weight: This has been ascertained by the volumetric process, utilizing the dust which passed through a sifter of 900 meshes to the square centimeter, and which failed to pass one of 4,900. Three tests were made with the average result, specific weight, 2.60.

3. Apparent density: To determine this the samples were dried in a Fremy stove at a temperature of 40° C., and were afterwards weighed in fine scales. The volume was found by means of hydrostatic scales after the samples had been first saturated in water and successfully weighed in the air and submerged in water. The difference between these two weighings in grams represents the volume of the sample in cubic centimeters and fractions of a centimeter. These tests were made with the average result, apparent density, 2.59.

4. Absolute porosity: This has been deduced from the specific weight and the apparent density, dividing the difference between the two by the specific weight, thus a figure is arrived at which represents the relation between the volume of voids and the total. Absolute porosity, 0.0038.

5. Tests of resistance to frost: For these tests four samples were used which had been previously saturated in water under the bell of the pneumatic machine at a pressure of 50 centimeters of mercury. They were then subjected during four hours to a temperature varying between —10° and —15° C. This operation was repeated twenty-five times with the following results:

Resistance to Frost.

Samples.	Weight.	Weight After Saturation.	Percentage of Water to Weight.	Effect of Freezing.
	Grams.	*Grams.*	*Grams.*	
G 5	902.1	902.7	0.0006	No apparent change.
G 6	714.0	715.5	0.0020	do
G 7	827.0	828.8	.0010	do
G 8	810.3	811.4	.0010	do

6. Resistance to wear and tear by friction: This test was made with a Dorry machine, constructed by Digeon, silicious sand being used, which passed through a hair sieve of 324 meshes to the square centimeter and not through one of 900. The stone used for comparison was Carrara marble. The stone was made to run at the uniform speed of 2,000 revolutions per hour, and both the sample under test and the other stone used were weighted with 250 grams to every square centimeter of surface under friction. The following are the average results of these tests:

Resistance to Wear and Tear.

Samples.	Weight per Square Centimeter.	Loss by Wear and Tear in 2,000 Revolutions.	
		In Height.	In Weight per Square Centimeter.
	Grams.	*Centimeters.*	*Grams.*
Carara marble	250	1.50	3.90
Garchey glass	250	.10	.34

The weight was applied vertically with the center of gravity in both samples.

JOSE MARVA, *The Colonel Director at Madrid.*

SWITZERLAND.

Upon consulting the principal architects in this city, I learn that glass bricks of different shapes and sizes are manufactured by the Falconnier Glass Works, in Horw, Canton of Lucerne. The bricks are considered most durable, and give great satisfaction. Their use in building has not been extensive as yet in St. Gall, consequently the architects have not been able to test their durability on a large scale. The few experiments that have been made in this city are restricted to roofing, for the purpose of conducting light into dark rooms, for cellars, subways, engine houses, etc. Glass paving bricks are imported into Switzerland from Germany.

THOMAS WILLING PETERS, *Consul-General, St. Gall.*

ZURICH.

Glass bricks for paving and building purposes are not made in this consular district. The city of Zurich, some fifteen months ago, ordered for trial a quantity of glass bricks from France to pave several hundred yards of a street where the traffic is very heavy. In a very short time, however, the space paved became in such bad condition that the bricks, being too brittle, had to be replaced by other material. It is thought that glass bricks may do well enough for paving sidewalks, but so far no trials have been made in this city, nor elsewhere in the district.

JOSEPH SIMON, *Deputy Consul at Zurich.*

ENGLAND.

BIRMINGHAM.

Glass bricks are not manufactured here, but I find that the Crystalline Company, located in my consular district, is preparing to make them for paving and building purposes.

This firm has patented and has for some time been using a special process of manufacturing tiles from glass com-"keys" or "grips" enabling the tiles to hold very firmly into a special cement, also patented, which expands and contracts "at the same ratio as the glass tiles." A publication devoted to Black Country industries, describing this tile, which it considers ideal and which has had a large sale, states that while the ordinary tiles were made from earthenware and had excessive weight and bulk and were difficult to use for covering irregular surfaces or for the adornment of ceilings and the lighter forms of decorative work, these difficulties have been overcome in the glass and china tiles. The new tile is hard and almost indestructible, light in weight, easily affixable to either regular or irregular surfaces, retaining its brilliancy without crazing, that is, cracking on the surface, and because of the grip or key at the back adhering perfectly and permanently, and it can be manufactured in any kind of curve, angle or molding. The publication also claims that the company has a process by which it is possible to produce any number of colors in glass, as many as thirty-six colors in one piece.

Finding that a colleague at Lyon, France (Consul John C. Covert), had reported the use in Lyon of glass bricks for pavements and for building purposes, I sent a copy of his acknowledging its receipt the Stourbridge manufacturer says that he is very well acquainted with the Garchey method, and while the material results are much like those of his own report to the Stourbridge manufacturer referred to. In process, he "gets a porous glass stone something like lava," and calls attention to the fact that many years before M. Garchey produced his glass bricks, the old French chemists, Reaumer and Pelouze, pointed out that "devitrification" was possible. He adds that Garchey certainly produces valuable material for building purposes, and that there are other firms in Jeumont and other parts of France and in Brussels making building blocks very cheap, and that these firms can also make imitation faience of glass stone, now largely used for building purposes. My Stourbridge correspondent expresses the belief that glass in various forms will in time supersede ceramic productions, because cheaper and more lasting, and not liable to craze, and he is very optimistic about the chances of his own process for making glass bricks, which, though requiring larger initial outlay, will be, he believes, cheaper than any of the others. Though unable to verify it, he has heard that a firm in England, near Castleford, has taken up the manufacture of bricks by the Garchey process.

MARSHAL HALSTEAD, *Consul.*

LEEDS.

About fifteen or twenty years ago bricks were manufactured in England from the slag left over in iron and steel works. In a trial section of paving with these bricks, that their practical usefulness might be determined, two serious and unexpected features were developed. As the bricks wore they became slippery, and while the slag brick was generally as hard as glass, soft spots occurred, causing holes therein. As neither of these objectionable features could be corrected, the attempt at the manufacture of slag bricks proved a failure. This was the nearest approach ever made in this district to the manufacture of glass bricks.

LEWIS DEXTER, *Consul.*

NEWCASTLE ON-TYNE.

The nearest approach here to glass bricks are scorial bricks manufactured in the Middlesbrough district from the waste slag from the ironstone blast furnaces. These bricks are only used for street paving, etc., and are not intended for building purposes, at least no case is known where they have been so utilized. The price varies from $2.68 to $3.16 per ton, free on trucks at the works. During the last ten years scorial bricks to the value of about $69,000 have been exported from Middlesbrough to the United States, chiefly to Philadelphia.

HORACE W. METCALF, *Consul.*

SHEFFIELD.

There are no bricks made from glass in this consular district, nor are any bricks made from this material used in the city of Sheffield either for paving or building purposes.

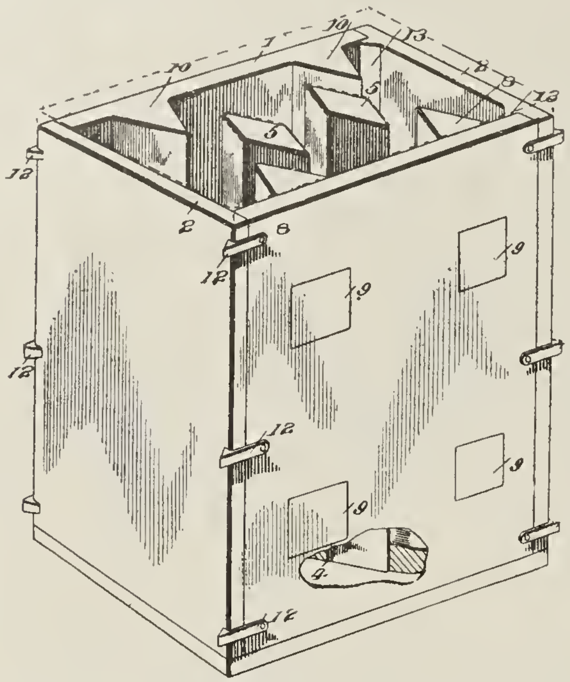
The authorities of the city have been engaged for some time in trying to convert the refuse from its garbage destructors into slabs for use in the construction of sidewalks and footpaths. This is done by grinding the slag to the requisite fineness, and in combination with cement, molding it into slabs. Fairly serviceable walks are obtained, and the garbage refuse is in this way disposed of. The experiment was commenced to determine whether this method of disposition would be more economical than to purchase ground and dump the refuse from the destructors thereon, and the experiment has not yet been tried sufficiently to warrant those engaged in it to advise its use generally.

CHARLES N. DANIELS, *Consul.*

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

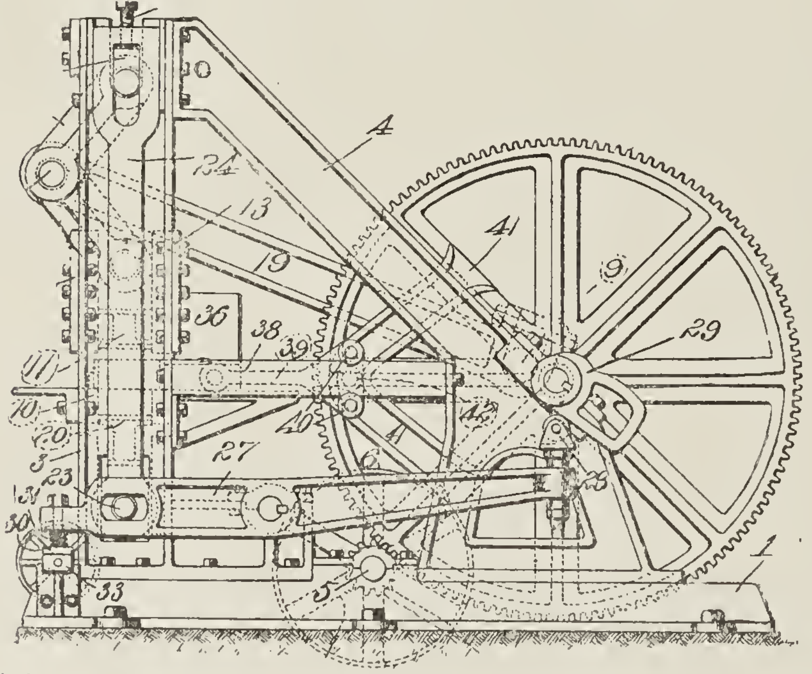
These new inventions are those that are especially of intest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

790,507. Mold for Cement Blocks. Oscar S. Lamberson, Rock Rapids, Iowa, assignor of one-half to J. S. Overmire and J. H. Jansen, Rock Rapids, Iowa. Filed Sept. 19, 1904. Serial No. 225,135.



Claim.—In a mold, the combination of sides and ends, catches carried by the sides and engaging the ends, the bottom provided with a plurality of openings, a plurality of core-blocks having their lower ends received in the openings of the bottom, one of the sides being also provided with a plurality of openings therein, core-blocks disposed against the inner faces of the sides aforesaid, and having projections received by the openings in said side, and core members integral with the other side of the mold and of substantially the same form as the core-blocks adjacent to the first-mentioned side.

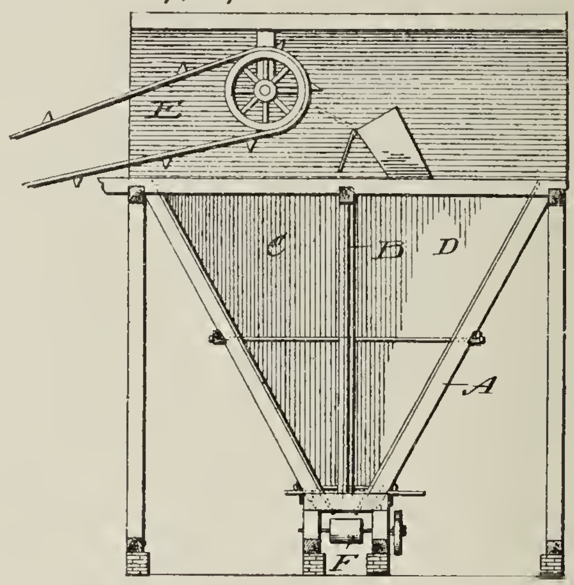
791,262. Brick-Machine. Walter P. Grath, St. Louis, Mo. Filed Nov. 4, 1904. Serial No. 231,346.



Claim 1.—A brick-machine comprising a frame, a mold supported in said frame, upper and lower movable plungers forming the top and bottom of said mold, a floating toggle in said frame, means connecting said upper and lower plungers to the opposite ends of said toggle, respectively, an actuating-shaft, and a pitman directly connecting said shaft and the middle pivot of said toggle, said pitman being supported only by said shaft and said middle pivot of said toggle.

A brick-machine comprising a frame, a mold in said frame, reciprocating plungers forming the top and bottom of said mold, means of actuating said plungers comprising rigidly-connected wheels, a reciprocating charger for said mold, guide-bars parallel with the direction of movement of said charger, mounted in and forming a part of said frame, actuating-cams mounted on said wheels and charger-actuating bars directly connected with said charger and provided with rollers engaging said cams.

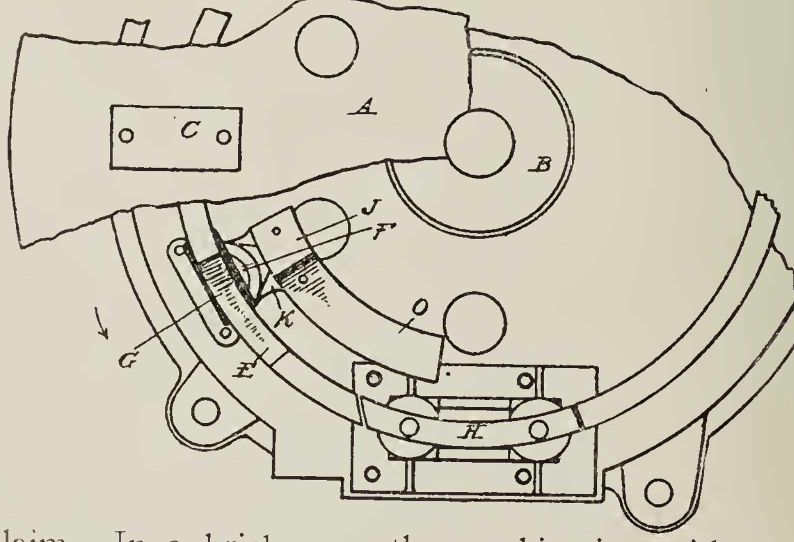
790,904. Process of Making Brick or Artificial Stone. Louis F. Kwiatkowski, New York, N. Y. Filed Oct. 10, 1904. Serial No. 227,887.



Claim.—In a process for producing artificial stone or brick from a composition including lime and sand, consisting in intermixing said ingredients and hydrating the lime, storing the mixed material in a depository in layers of different ages, and thereafter commingling portions of each of such layers of ingredients; and molding same.

In a process for producing artificial stone or brick from a composition including lime and sand, consisting in intermixing said ingredients and hydrating the lime, then depositing the mixed material into a V-shaped depository in layers, permitting the material to sit in said depository for a predetermined time and then commingling portions of each layer of material, conveying same from the bottom of the depository to a molding apparatus, substantially as described.

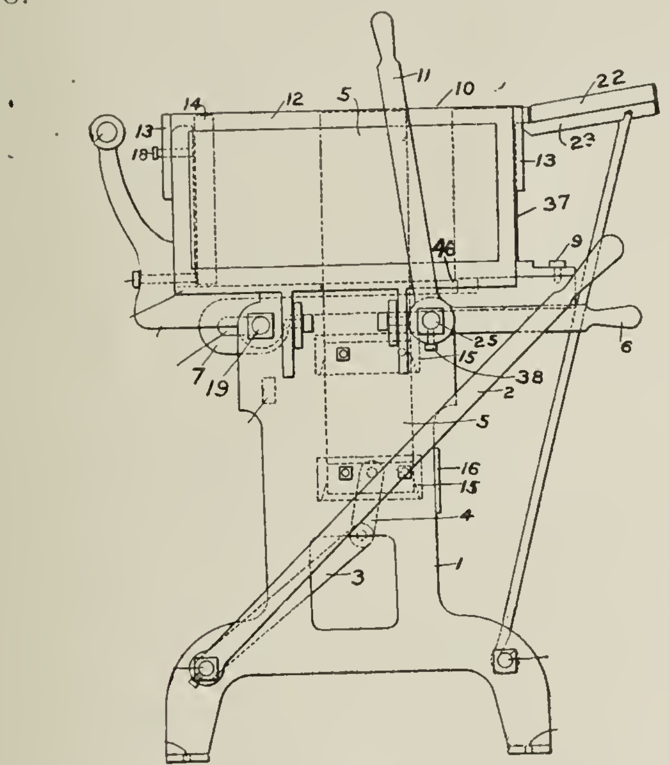
791,007. Brick-Press. Edgar D. Church, Saginaw, Mich., assignor to American Sandstone Brick Machinery Co., Saginaw, Mich. Filed April 4, 1904. Serial No. 201,452.



Claim.—In a brick-press the combination with a rotary table having a vertical mold-pocket therein and a plunger slidingly fitting said pocket, of a cam-track upon which the lower end of said plunger is supported and over which it travels, said track having an adjustable depression therein for permitting said plunger to be lowered, and an adjustable flange arranged adjacent to said depressed portion adapted to positively actuate said plunger to compel the descent thereof.

In a brick-press the combination with a rotary table having a mold-pocket therein and a plunger slidingly fitting said pocket, of a track arranged beneath said table with which the lower end of said plunger engages and over which it is adapted to travel, said track having a depressed portion therein, an inclined flange within the track arranged adjacent to the depressed portion thereof, and an outwardly-extended lug on said plunger adapted to clear said flange when said plunger maintains its contact with said track, and to engage said flange and to co-operate therewith for positively depressing the plunger whenever the latter fails to lower by gravity.

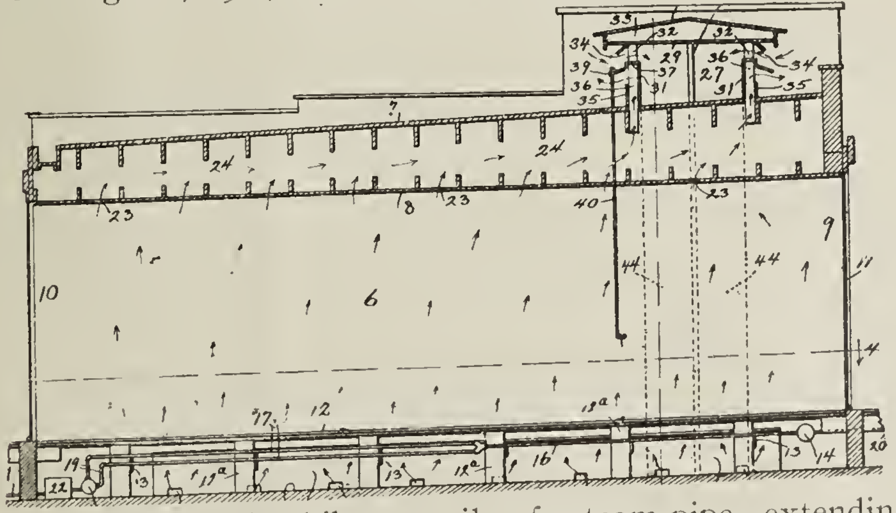
791,417. Machine for the Manufacture of Hollow Building-Blocks. Fred W. Hagloch, Cleveland, Ohio, assignor to The Standard Sand and Machine Company, Cleveland, Ohio, a Corporation. Filed March 7, 1904. Serial No. 196,980.



Claim.—In a block-molding machine, in combination, a tilting bottom plate, cores slidable vertically therethrough, hinged ends, and a pallet adjustably supported between the ends.

In a block-molding machine, in combination, a bottom plate pivoted to tilt thereon, ends, a rear panel slidable on the frame and engageable over the rear edge of the bottom plate, to prevent tilt thereof, an adjustable pallet carried on the bottom plate and forming the front side of the mold, and cores slidable vertically through the bottom plate.

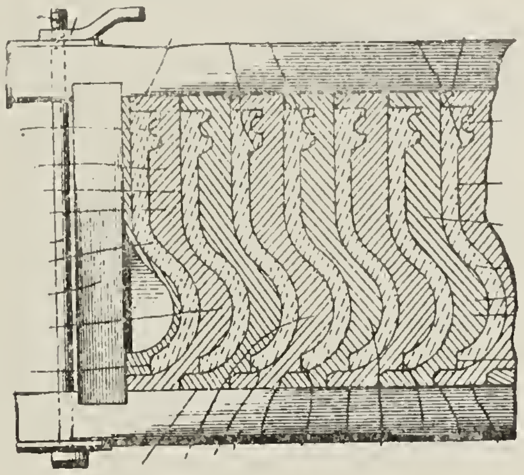
791,406. Dry-Kiln. Benjamin D. Curtis, Chicago, Ill. Filed Aug. 26, 1904. Serial No. 222,340.



Claim.—In a dry-kiln, a coil of steam-pipe extending longitudinally in said kiln, one end of said coil being a single pipe and the remaining end being a double pipe, the ends of said two pipes terminating in vertical pipes connected to a single pipe or drain.

The combination of a dry-kiln, a longitudinal flue in the bottom of said kiln provided with a plurality of openings communicating with the interior of the kiln, a longitudinal flue in the top of said kiln provided with a plurality of openings communicating with the interior of the kiln, a ventilator on the top of said kiln, a flue forming communication between the last-named flue and said ventilator and a flue forming communication between the first-named flue and said ventilator.

791,019. Process of Molding Tile. John A. Ferguson, Denver, Colo. Filed Jan. 24, 1905. Serial No. 242,494.



Claim.—The herein-described process of simultaneously molding a plurality of ornamental tile, which consists in introducing into a mold-box a series of detachable unyielding fillers, interengaging said fillers with each other to form spaces therebetween, and presenting obstructions at each end of said spaces introducing the plastic material into said spaces and between the ends formed by said interengaging fillers, allowing the said material to set and then removing alternately the fillers and the molded product.

A VALUABLE RECORD BOOK.

One of the most practical books for the clayworker that has ever come into our office is Kiln Records. It is a record book to show what each and every kiln is doing, how much it costs and the time consumed. In fact, any clayworker who would use a book of this sort would always know just where he stands.

Willard D. Richardson, A. M., consulting engineer to the brick industry copyrighted this book. It is made up from practical knowledge that he has gained by his long and thorough work in the field. Mr. Richardson will be glad to consult with any clayworker on this subject.

TO ASBURY PARK, JULY 3 TO 7.

The most attractive eastern excursion during the coming Summer will be to Asbury Park, N. J , on occasion of the Annual Meeting of National Education Association, July 3d to 7th, inclusive, via the Nickel Plate Road and its connections, either the West Shore or Lackawanna Road, with privilege of stop-over at Chautauqua Lake points, Niagara Falls and New York City. Rate $21.35 for the round trip Dates of sale, June 29th and 30th and July 1st and 2d, with extreme return limit of August 31st, by depositing ticket. Patrons of this route may have the choice of a ride over the most interesting mountain scenery in New York and Pennsylvania, and through the celebrated Delaware Water Gap, or through the beautiful Mohawk Valley and down the Hudson River, which also includes the privilege of a ride on day line boat on Hudson River, between Albany and New York City, in either direction, if desired. No excess fare charged on any train on Nickel Plate Road. Meals served in Nickel Plate dining cars, on American Club Meal plan, ranging in price from 35c to $1 00; also a la carte. Chicago Depot, La Salle St. Station, corner Van Buren and La Salle Sts City ticket offices, 111 Adams St. and Auditorium Annex.

For further particulars address John Y. Calahan, General Agent, 113 Adams St., Room 298, Chicago.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,

Ninth Floor, Plymouth Building,

303 Dearborn Street,

CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.

Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVI. JUNE 30, 1905. No. 12

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

You can sell honor only once.

The CLAY RECORD is the only semi-monthy clay journal in America. It costs One Dollar per year. Subscribe for it. Advertise in it.

Remember these are warm days and your horses have tongues but can not tell you whether they are thirsty or not. Try them often.

Of course, it takes great tact to tell another man how to run his own business, and here and there a man who would resent suggestions from the wisest person on earth gets on his dignity and returns nothing but sarcasm to the venturesome suggester.

Many times while reviewing the stirring and startling events that have been public in recent weeks the thought has come to the fore how fortunate for this nation that its people are not in temperament like the French, impulsive and excitable, for had they been so, a report of the conditions of business, if a truthful report were written, had been very different from what we now write.

Notwithstanding the rottenness of the "Equitable" revelations, the Gas graft in Philadelphia, the strike in Chicago and the weak and cowardly municipal management of affairs, the people under many difficulties and subjected to numberless annoyances have persevered in their efforts to keep busy and execute their plans previously laid, and we are able to report that in all directions with the possible exception of the retail trade the conditions of trade have been extremely favorable, and in many lines the volume of business has exceeded any previous season.

It is "a long lane that has no turn" and it is to be hoped that the same sturdy common sense which has prevailed may continue, and when the equilibrium is again restored that the experience passed through with the lessons it has taught that the common sense of the people shall demand of the law makers the necessary legislation to make a repetition of these recent experiences impossible, and when opportunity at the polls presents itself drive from public offices the cowards and time-servers and replace them with men of the "Folk" stamp who are not afraid to execute the laws.

We, like many others, have felt compelled, from time to time to say many sharp things against this business of striking, and the burden of the criticisms rested on the leaders of the unions holding them responsible for many strikes for which we could find no reason or justification, and insisted that it should not be permissible that a strike should be called without first exhausting every means of avoidance of a strike through the medium of arbitration. The assumption being that the employers were not accomplices in any manner, shape or form. Our surprise may be imagined upon becoming acquainted with certain revelations through jury investigations justifying or demanding that conspiracy indictments issue against certain officers of a big corporation engaged in the manufacture of brick.

We are not alone surprised but mortified to learn that employers are accused of being accomplices with leaders of labor organizations in bringing about strikes with the object in view to destroy the competition of independent manufacturers. And worse than all is, that from the testimony given it may be inferred that many of the labor troubles through which we have passed can be traced to bribery of leaders of labor unions by employers. Further it is certainly distressing that from these revelations while there is no proof whatever, it is impossible to avoid thinking that the present strike of the teamsters was caused by one concern trying to injure through a strike, another firm's business.

We all should be slow to think evil, and the wish is father to the thought that after full investigation the contrary may be proven, but if the allegations above recited be proven we have an opinion of such conditions which we shall not hesitate to express in the strongest terms.

COURSE IN CERAMICS FOR ILLINOIS.

It was recommended that a course in Ceramics be constituted in the University at Urbana at a cost not to exceed $5,000 per year, the amount appropriated by the Legislature at its last session for this purpose, and that the President of the University be authorized to submit to the board the outline of a suitable curriculum and to nominate the necessary instructors in this department so that, if possible, work may be begun in the coming autumn. It is further recommended that upon the organization of such a course an advisory committee be constituted of the Illinois Clayworkers' Association and other similar organizations may be invited to elect members, and, further, that 102 free scholarships, one for each county, be granted in this course, to be assigned by the University on nomination of the Illinois Clay Workers' Association.

Voted that these recommendations be adopted at the meeting of the Board of Trustees of the University of Illinois, June 2, 1905.

ACCIDENTS, DAMAGES AND FIRES.

The Tuscola (Ill.) Brick & Tile Works caught fire at 10 o'clock in the evening and was completely destroyed.

The St. Paul (Minn.) Pressed Brick Co., Stewart Ave. and Bay St., had a loss by fire to its buildings amounting to $1,000.

An over-heated kiln in the brick yard of the Koenig Brick Co., at Osage and Marine Aves., St. Louis, Mo., carried a loss by fire of $1,000.

The Cleveland Brick Co., Davis Railroad & Coal Co., Mineral City Supply Co., and W. T. Davis of Canton, Ohio, as an individual, have been declared a bankrupt.

A premature explosion at the pit of the Jamestown (N. Y.) Shale Brick Co. nearly caused the death of the foreman and a laborer, a defective fuse caused the trouble.

Mrs. C. M. Kauffman has asked that a receiver be appointed for the Home Brick Co., Iola, Kan., claiming mismanagement, etc. She owns 1-5 of the stock of the company.

Justice Stapleton, of Denver, Colo., has fined Patrick Rogers, a brick manufacturer, $50.00 for operating a brick yard outside the city limits. Such justice is an insult to American people.

Some miscreant opened the water valve in the big cylinder at the new plant of the Menominee (Mich.) Brick Co.'s plant and had it not been discovered in time would have wrecked the plant.

The Hitchcock (Okla.) Cement Works was totally destroyed by fire, causing a loss of $85,000, insurance $18,000. All the buildings and working property was a total loss. This was a new and thriving enterprise.

An attempt was made by three unknown men to blow up the brick and tile factory of John W. Emerick at Dunfee, Ind., with dynamite. Mr. Emerick discovered the men and with help of neighbors made them leave.

Jacob Templen, an employee of the Brooks (Ind.) Brick, Tile and Terra Cotta Works, was struck by lightning and instantly killed. The lightning struck him squarely on the head and nearly every bone in his body was broken.

OBITUARY.

William L. Wallhead, a prominent brick manufacturer of Elyria, Ohio, died at his home in that city. He manufactured brick for 36 years.

Mark B. Stephenson, proprietor of the Parkersburg (W Va.) Brick Works, died from poison administered by himself. Financial reverses caused him to do it.

Walter S. Hellier, one of Bangor's (Maine) best citizens and a brick manufacturer died at his home after an illness extending over several months. He was 70 years old, and leaves a widow and four children.

Adam Schneider, one of the oldest brick manufacturers and contractors of Columbus, Ohio, died from a combination of kidney and heart troubles. He was 69 years old and survived by a widow and five children.

Henry Brunt, age 71 years, one of the oldest manufacturing potters in East Liverpool, O., is dead. He was born in England and came to East Liverpool 50 years ago and engaged in the pottery business. His widow and three children survive.

A NEW PATENT CLAY WASHING MACHINE.

Charles B. Herrick of Utica and J. W. Baldwin of Ottawa, Ill., have been granted a patent on a clay washing machine which promises to work a revolution in the tile and brick making industry. One machine has already been built at the foundry of W. H. Knowles, and has been erected at Utica for experimental purposes, and to ascertain the defects in the machine if any there be.

The clay washing machine comprises a suitable frame, a stationary tank secured in position by the frame and having a discharging orifice at its lower end and adapted to be filled with water in combination with a perforated tank rotably mounted in the upper end of the stationary tank. Then there is a vertical agitator blade intended to cut the clay as it passes into the perforated tank. A diaphragm separates the upper and lower parts of the stationary tank, whereby the water below the diaphragm will be left unagitated. The principal purpose of the machine is to separate the stones from the clay by means of water. The clay dissolved passes through a screen, the clay passing through and refuse and the stones removed by an automatic shovel. In many parts of the country the manufacture of tile and brick is impossible because of the presence of limestone, and it is to remove this substance that Messrs. Herrick and Baldwin have perfected the machine.

$14.00 TO CHAUTAUQUA LAKE, N. Y.

and return, from Chicago, via Nickel Plate Road, July 7th, with extreme return limit of August 8th, by depositing ticket. No excess fare charged on any train on the Nickel Plate Road. Cheap rates to other eastern points. Three trains daily, with vestibuled sleeping-cars. Individual Club Meals, ranging in price from 35c to $1.00, served in Nickel Plate dining cars; also service a la carte, and Mid-day Luncheon 50c. Write John Y. Calahan, General Agent, 113 Adams St., Room 298, Chicago, Ill., for particulars. Chicago city ticket offices, 111 Adams St. and Auditorium Annex. Chicago Depot, LaSalle and Van Buren Sts.—on the Elevated Railroad Loop.

CEMENT AND CEMENT MILLS IN MEXICO.

The second cement mill in Mexico has been organized under the firm name of the Monterey Portland Cement Company, with a paid-up capital of $400,000. It will be located at Monterey, the capital of the State of Nuevo Leon. The demand for cement in this Republic is steadily increasing and is likely to reach 300,000 barrels this year. Cement was formerly nearly all imported from the United States and Germany.

A MILLION BRICK PER DAY NOT ENOUGH TO SUPPLY CLEVELAND.

The marvelously steady growth of Cleveland, Ohio, is strikingly evidenced, more so than ever this season, by the tremendous business being done by the numerous brick manufacturing concerns of the city. An investigation of trade and building conditions, as revealed through the brick manufacturing industry, discloses the fact that this city will consume between 250,000,000 and 275,000,000 brick during the present building season.

The total quantity of brick is made up of common and pressed building brick, shale brick and paving and sewer brick. There are twenty concerns in this city engaged in the manufacture of brick with a total output of over 1,000,000 brick daily. Just at present this output is not large enough to supply the demand. In other words, this city is at present consuming more than 1,000,000 brick every day.

Added to this are convincing indications that the present unprecedented demand will continue up to the very end of the building season. Brick manufacturers say that the season's record will show the use of a daily average of 1,000,000 brick for between seven and eight months of the present year.

After appealing in vain for brick for several days, a contractor managed to obtain two loads for immediate delivery. He wanted twelve loads and was told that the immediate delivery of two loads would be made only as an accommodation.

Out of the total of over 1,000,000 considerably more than 600,000 are building brick. This figure includes the daily consumption of pressed brick, which is figured at about 50,000.

"The encouraging thing is that the great consumption of brick in no way indicates unusual conditions or the uncertainty of boom times," said F. H. Eggers of the Eggers Brick Co. "On the contrary, it is simply a magnificent demonstration of the steady growth of Cleveland. Two years ago was a splendid season. Last year was not quite so good, but the indications are that the present year will be the banner year in the history of the city.

"And the splendid thing about it all is that there is every reason to believe the same conditions will continue next year and the year after, only marked by increasing sales and, of course, an increasing demand."

There are fourteen common brick manufacturers in or near the city with a daily output of over 600,000, five shale brick concerns with a daily output of over 400,000 and one hydraulic pressed brick manufactory with a daily output of between 40,000 and 50,000.

MORTAR COLORS AN IMPORTANT ITEM IN BUILDING.

Mortar color is a small part of the building, yet it is what shading is to writing or emphasis to speech. Ricketson Mineral Paint Works, Milwaukee, Wis., have well merited the award for brilliant shade and strength in coloring properties. Their colors are used extensively and throughout the United States, for Mortar, Brick, Building Blocks, etc. They have issued new circulars which they are distributing.

SCOTT MANUFACTURING CO. BIDS LOWEST AT DETROIT.

The Scott Manufacturing Co. of St. Louis, Mo., was the lowest bidder for the construction of a municipal brick plant at Detroit, Mich., when bids were opened under a third advertisement of the contract. This company, at whose request the contract was readvertised, after Commissioner Maybury had recommended the bid of the C. W. Raymond Co., of Dayton, O., at $47,565, submitted a bid of $39,897 for a plant of 20,000 brick capacity a day. The Raymond Company, with a few things eliminated from its specifications, offered to build a complete plant for $43,456. Hadley Bros., of Canton, O., bid $45,000, and Herman Reich of this city submitted a proposal of $43,550.

For a plant of 30,000 brick a day capacity, the bids were: Reich, $45,850 and $47,850; Scott Manufacturing Co., $48,893; Hadley Bros., $54,000.

Commissioner Maybury talks as though a plant of 20,000 capacity is desired.

SHUTTING DOWN BOILERS.

As our method of shutting down at night is different from any I have seen, I will explain it. About fifteen minutes before shutting-down time, if the feed pump is not running, it is started and the boilers filled to three gages, pump running very slowly. Next, bank the fires by pushing live coals against the bridge wall and cover with fresh coal. Close the furnace, ash-pit doors and damper. By this time we are ready to shut down, and do so by closing the water column valves, pump line valves (both water and steam), and the main stop valve on each boiler. We now have all the steam confined in the boiler at about 90 pounds pressure.

Of course we always have the safety valves in good order, but seldom does the pressure reach the blow point, which is 115 pounds. We always cover our fires quite heavy and they hardly ever burn through. This makes a little more work than pulling down a bank that is burned through nicely, but we always have a good fire to start with and from 80 to 100 pounds of steam.

About half an hour before starting up we open the stop valve just enough to allow steam to pass, warming the pipes, and expansion takes place gradually.

Before starting be sure to open all valves which were closed when shutting down or you may have trouble.

The above method will save 300 to 500 pounds of coal a day, besides preventing a whole lot of unnecessary boiler contraction and expansion. We have made use of this method for three years, and it has given the best of satisfaction.

BIG BRICK PLANT IS TO LOCATE IN CHICAGO HEIGHTS.

The National Brick Company of Chicago has made arrangements with the Chicago Heights Land Association for the location of its immense works in Chicago Heights and has purchased eighty acres of land, having a frontage of half a mile on Twenty-sixth street, extending from Stewart avenue to State street. The company will at once begin the erection of buildings suitable for its business, including a two-story office building and a power-house which will be equipped with a 700 horse-power Corliss engine and a generator of sufficient capacity to operate the entire works as well as to furnish light. Electric distribution for power will be used throughout the entire works.

All the buildings will be of brick, stone and steel construction and when completed will be the most modern and up-to-date brick plant in America. The works will have a daily capacity of about 600,000 common brick. The following, who have been engaged in the brick business in and around Chicago for the last thirty years, are among the stockholders and officers of the new company: B. F. Weber, Henry Busse, Louis Riemer, F. W. La Bahn and A. S. Wehrheim.

The buildings and equipment when completed will cost about $550,000. B. F. Weber, as president of the company, stated that he and his associates selected Chicago Heights on account of its superior railway and shipping facilities. "For example," he said, "at Chicago Heights we have the combined advantages of thirty-six railways and the switching service is so arranged that we can entirely dispense with teaming. In addition to this we have a rate of $5 a car to Chicago, which enables us to place our brick in the Chicago market at as low a price as any yard in the country. We also discovered at Chicago Heights an exceedingly fine quality of clay. I can say without fear of contradiction that there is no clay in Cook county that can equal the Chicago Heights clay for brick, tile and fire-proofing purposes. Upon investigation we found it to be from sixty to ninety feet in depth, and inasmuch as our plant is located on a hill we will be able to so arrange our works as to permit us to work in a face of clay at least twenty-five feet high." C. A. Shank, an experienced railroad traffic manager, has been given full charge of the traffic department of the new company.

$12.25 TO BUFFALO, N. Y.

and return, via Nickel Plate Road, from Chicago, July 8th, 9th and 10th, with extreme return limit of August 4th, by depositing ticket. Stopover, allowed at Chautauqua Lake points. Also lowest rates to Ft. Wayne, Cleveland, Erie and other eastern points. Three trains daily, with first-class equipment. Meals served in Nickel Plate dining cars, on American Club Meal Plan, ranging in price from 35c to $1.00; also service a la carte. No excess fare charged on any train on the Nickel Plate Road. If contemplating an eastern trip, write John Y. Calahan, General Agent, 113 Adams St., Room 298, Chicago, Ill. Chicago Depot, corner Van Buren and LaSalle Sts.—the only passenger station in Chicago on the Elevated Railroad Loop.

BIDS OPENED FOR THE WASHINGTON BARRACKS IMPROVEMENT.

Capt. John S. Sewell, the engineer officer in charge of the extensive works in progress at the Washington (D. C.) barracks reservation, opened bids for 7,000,000 common red brick and a quantity of porous terra cotta hollow tiles for use in those works. The Anacostia Brick Company offered to supply the brick at the rate of $8.70 per thousand, and John M. Miller for $8.42 per thousand. The Potomac Terra Cotta Company of this city offered to supply the various kinds of terra cotta at 32 cents, 22 cents and 16 cents, while the bid of the National Fireproofing Company was 26 cents, 17½ cents and 13 cents.

MINERS TURN BRICKMAKERS.

At the annual meeting of the Columbus & Hocking Coal and Iron Company, held in Columbus, Ohio, H. C. Seixas, of New York, a director of the Sloss-Sheffield Steel and Iron Company, was elected to the directorate, succeeding Henry Gumble, resigned.

President N. L. C. Kachemacher and all the other officers were re-elected. The annual report shows that the cost of production has been reduced fifteen cents a ton for coal.

The company decided to embark in the manufacture of brick, $1,000,000 being available for the new departure.

NEW ENGLAND BRICK YARDS CO. STATEMENT.

The New England Brick Yards Company has filed the initial statement of its financial condition on Feb. 1, 1905, with the secretary of the commonwealth:

ASSETS.	
Real estate and machinery	$ 799,500
Capital stock of N. E. Brick Co.	300,000
Total	$1,099,500
LIABILITIES.	
Capital stock	$ 366,500
Funded debt	733,000
Total	$1,099,500

NEW ENGLAND BRICK CO.

The New England Brick Company has filed the first statement of its financial condition on Feb. 1, 1905, with the secretary of the commonwealth:

ASSETS.	
Horses, wagons, tool supplies, machinery	$ 42,489
Brick	425,060
Stock in process	46,095
Cash and debts receivable	69,510
Old Colony Trust Co. receiver's amount	15,498
Suspense	204
Total	$598,856
LIABILITIES.	
Capital stock	$300,000
Accounts payable A. E. Locke, receiver	56,209
Accounts payable N. E. Brick Co.	39,742
Floating debt	33,581
Surplus	34,191
Receiver's certificates	84,632
Old Colony Trust loans	50,000
Reorganization expenditures	500
Total	$598,856

SAND OR LIME-BRICK OR BLOCK NEWS.

Jesse Graham, Janesville, Wis., has bought machines for the manufacture of cement bricks.

Robert Smith, Toronto, Ontario, is touring the country inspecting sand-lime brick plants.

C. H. Felton, Michigan City, Ind., has just added a new cement brick making machine to his plant.

The building of the buildings for the Sand-lime Brick plant at Laketon, Ind., are now in progress.

The Ft. Wayne (Ind.) Pressed Brick Co. are now making sand-lime brick. The plant formerly was a cement brick plant.

The Diamond Brick Co.'s plant northeast of Muncie, Ind., is now completed and is giving employment to more than 50 men.

J. N. Keerl and A. H. Cummings, principal promoters, are organizing a company which will erect a sand-lime brick plant at Mason City, Iowa.

The Ohlemacher Brick Co., Michigan City, Ind., has just closed a contract with a Chicago contractor for the delivery of 3,000,000 Ohlemacher sand-lime brick.

The Seminole Press Brick Co., Jacksonville, Fla., has been incorporated with $30,000 capital stock. Raymond Cay, president, and J. K. Munnerlyn secretary and treasurer.

The call has been made to dissolve the American Cement Pressed Brick Co., Cincinnati, Ohio. The company went into the hands of a receiver some time ago and is now being wound up.

The Butler County Brick Co., Hamilton, O., has been organized with Paul Pfennig and August Kiemmerling as the principal stockholders. Their plant is located at High St. and Monument Ave.

The Alleghany Sand-Lime Brick & Construction Co., Wellsville, Ohio, has been incorporated with $50,000 capital stock. Incorporators are: Victor M. Allen, Elmer J. Johnson, T. F. A. O'Donnell, all of Genesee, Pa.

A fourteen story high class appartment is now being built of sand-lime brick on 28th street, New York City, the second building east from 5th Ave. This is the highest building built of sand-lime brick in this country.

The Michigan Mfg. & Mercantile Co., Grass Lake, Mich., has been incorporated with $10,000 capital stock. They will make cement brick. Edward J. Foster of Grass Lake is a stockholder and Lamont S. Bidwell, Frank A. Vernor and Isaac N. Payne of Detroit.

The Leifer Mfg. Co., Little Rock., Ark., has been incorporated with $50,000 capital stock. The incorporators are George Leifer, J. H. Lenon, S. G. Woodsmall, H. G. Woodsmall, M. J. Baker, H. K. Ford, J. K. Riffle and G. W. Sappington. They will make concrete building blocks.

The Cuyahoga Concrete Co., Cleveland, Ohio, has been incorporated with $100,000 capital stock. The following officers have been elected: J. H. Libby, president; F. S. Barnum, vice-president, and F. H. Anderson secretary and treasurer. The plant has a capacity of 10,000 blocks daily.

MISCELLANEOUS ITEMS.

Joseph West of Rockport, Mo., has started a brick yard at Nemaha, Neb.

Raney Bros., Fairfield, Iowa, will double the capacity of their brick and tile plant.

Antlers, I. T., is to have a $25,000 shale brick plant, the machinery has been ordered.

J. A. Morgan, Burlingame, Kansas, is tearing down the brick and tile factory and selling the material.

Formal notice of dissolution has been made by the Detroit (Mich.) Brick & Tile Co., also of the Hall Brick Co.

T. A. Habel of Henning, Ill., is making tests of Pocahontas, Ia., clay with a view of starting a tile plant there.

G. W. Songer, Hoopston, Ill., is in the market for a good second-hand outfit for making brick and tile. He will locate in Texas.

The Coon Creek Coal Co., Clinton, Mo., has increased its capital stock from $50,000 to $100,000 and will build a plant for vitrified paving brick.

J. B. Speed & Co., Louisville, Ky., will build a $250,000 portland cement plant at Speeds, Clark Co., Ind. The plant will make 800 barrels of cement daily.

The National Roofing Tile Co., Lima, Ohio, has been incorporated with $100,000 capital stock by W. H. Duffield, John M. Bingham, C. F. Stolzenbach and D. J. Cable.

The immense new brick plant of the Pennsylvania Steel Co., at Steelton, Pa., for making fine ore and scale into brick for use in the blast furnaces, has been fired for the first time.

The Humboldt (Tenn.) Brick & Tile Co. has been incorporated, with $10,000 capital stock. H. C. Burnett, J. B. Stallings, Jno. T. Brown, Dr. G. W. Penn and M. B. Charles are the incorporators.

The United Brick Co., Conneaut, Ohio, has been incorporated, with $130,000 capital stock, $30,000 preferred, by H. G. Kingdom, H. L. Cox, A. B. Crittenden, James R. Stopfer and Jennie S. Porter.

The Walla Walla (Wash.) Brick & Tile Co., which was recently incorporated, has machinery on the ground and ready to put up. T. T. Hoover, of Portland, Oregon, is interested and will take the active management.

The Gillam Clay Development Co., Coffeyville, Kan., with a capital stock of $125,000, has been chartered. The incorporators are J. M. Gillem of Coffeyville and W. W. Bowater of Chicago, Ill., and G. V. Pattison, Guthrie, Okla.

The Pierre (S. Dak.) Cement, Brick & Oil Co. has been incorporated with $500,000 capital stock by J. L. Lockhart, H. D. Jennings, and S. G. Trine, The incorporators own two miles of river front which contains large deposits of shale for cement making.

The Malvern (O.) Fire Clay Paving Brick Co. has been incorporated, with $150,000 capital stock, in West Virginia, by Dr. W. H. Woodruff, Allen B. Creighton and associates. The plant will be built between Malvern and Waynesburg. N. A. Lewton is manager.

Alfred Doull has bought land and will put in a brick plant at Grangeville, Idaho.

There are many attractive bargains in the small ads on page 38 of this issue of the CLAY RECORD. Look them over.

The John Murgatroyd Brick & Tile Co., Vesper, Wis., has started up making brick and later will add machinery for tile making.

New brick machinery has been installed in the Door County Mfg. Co.'s plant at Forrestville (Wis.) and the plant started for the season.

The Shackelford Brick Co., DesMoines, Ia., are building a hollow block chimney at their plant 125 feet high and 16 feet through at the base.

The Flint Brick Co., Des Moines, Ia., plans to expend $10,000 for improvements to their plant; a new dryer 150x 90 with a 125-foot stack will be put in.

E. H. Ford of Terre Haute, Ind., says that a brick plant is to be built on the site of the old Powder mill at Newport, that it contains fine shale, etc.

Henry H. Ault, Toronto, Ohio, has been awarded the contract to built twenty 30-foot kilns for the Great Northern Sewer Pipe Works owned by Stratton Bros.

The Judsonia (Ark.) Brick Co. are burning two kilns of brick for immediate orders. They have bought additional land and Nat Young of Bald Knob has charge of the yard.

Plans are being carried out for doubling the capacity of the Hays borough plant of the Harbison-Walker Refractories Co. New kilns, drying rooms and furnace rooms are being built.

Brick are now arriving in New York City at the rate of 6,000,000 daily and the demand is such that none are being held in reserve. Hudson River commons are selling at $9.50 to $9.75.

The Cookeville (Tenn.) Brick Co. has recently been incorporated and the following are officers. Rutledge Smith, president; G. H. Howe, vice-president, and A. P. Barnes secretary and treasurer.

The National Brick Co. of Chicago, will locate one of the three plants that they are to build at Lowell, Ind., another at Chicago Heights, Ill., and the other at Weber Station near Evanston, Ill.

The Denny-Renton Clay & Coal Co., Seattle, Wash., has been incorporated with $1,000,000 capital stock by Moritz Thomsen, James R. Miller and E. J. Mathews of Seattle, Peter Larson of Helena, Mont., and T. L. Greenough of Missoula, Mont. This is a consolidation of the Denney and the Renton Clay Cos.

The Yucatan Brick Co. has been incorporated in New York City, with $50,000 capital stock. Incorporators are William H. Walton, 1076 Broad St., Newark, N. J., Lindsay Morris, 129 Rochelle Ave., Philadelphia, and Francis N. Whitney, 71 Broadway, New York. The plant is to be in some foreign country.

A brick yard is to be opened up at Lamont, N. Dak.

J. L. Berge has opened up a brick yard near Dixie, Wash.

J. T. Leach will enlarge his brick and tile works at Center Junction, Ia.

The Wade (N. C.) Brick Co. has been incorporated with $25,000 capital stock.

The Banner Clay Works Edwardsville, Ill., has increased its capital stock from $100,000 to $150,000.

Directors of the Illinois Brick Co. have declared a quarterly dividend of 1½ per cent, payable July 15.

Plans are being prepared for additions to the several plants of the Standard Brick Co. at Evansville, Ind.

O. R. Hartel, Lewisburg, Pa., has opened up a brick yard and now has it in running order. Arthur Root of Wilkesbarre is the superintendent.

Porter Bros. & Fleming Brick & Tile Co. have bought the G. K. Hull works at Leonardsburg, O., and are improving it all the way through.

R. W. Beale & Sons, owners of the Clay mines at Puryear, Tenn., are contemplating the establishing of a plant for the manufacture of fire brick.

The Columbia Finance & Trust Co. have sold the old brick plant at Cloverport, Ky., to Ed. A. Glockner of Chicago. who will resume operation at once.

The Scott Mfg. Co. of St. Louis, oM., was the lowest bidder for the municipal brick plant at Detroit, Mich. Contract not let until the new commissioner is seated.

The Bolivar (Tenn.) Brick & Tile Co. has been incorporated, capital $4,000. The incorporators are J. Kahn, Dr. B. V. Hudson, T. W. Breeden, J. R. Sweeton and Dr. R. W. Tate.

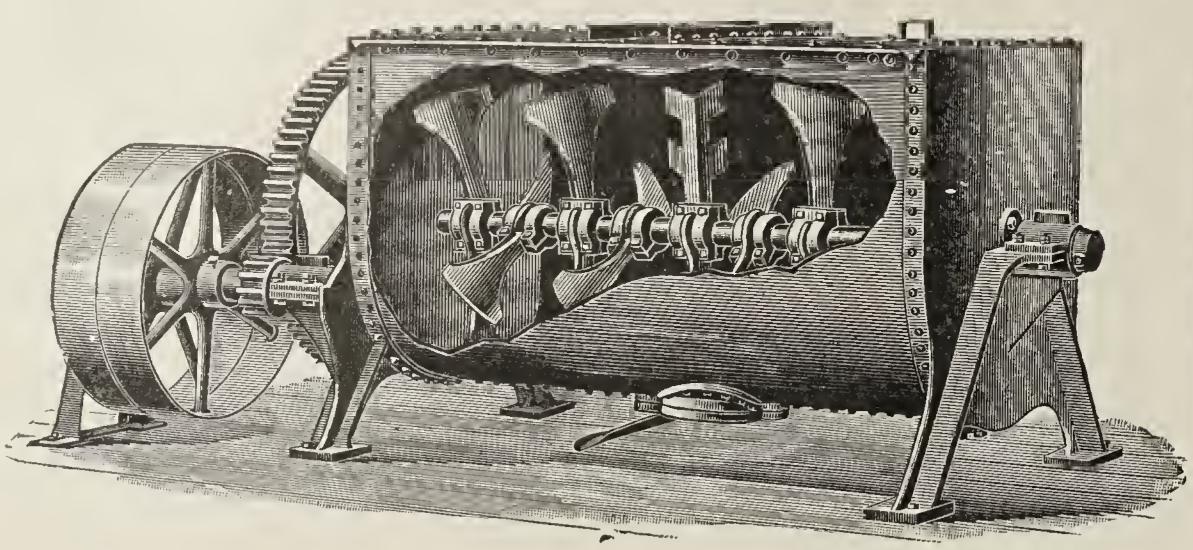
The Falls Creek Stone & Sand Co. has been organized at Portland, Me., with $205,000 capital stock. The officers are I. C. Libby of Portland, president; H. L. Greeley of Portland, treasurer.

The United States Brick Co., Reading, Pa., has bought the Harper-Norton Shale Co. at Conneaut, Ohio, and will at once overhaul the plant and manufacture brick on an extensive scale.

J. F. Wilson and Wm. Lentz of Pine River, Mich., have opened up a brick and tile works near the Pine River bridge at King's Corners (not a P. O.) and installed a brick and tile machine.

The Ohio Portland Cement Co., Wellston, O., has been incorporated with $750,000 capital stock by J. A. Lockard, L. F. Barnes and Grant McGhee of Wellston, Michael Kramer of Chillicothe and D. Linn Gooch of Covington, Ky. They will buy land from the McGhee Coal Co. and build a cement plant brick works.

The Harrisburg (Pa.) Clay Co. has been incorporated with $25,000 capital stock by E. Z. Rinkenbach, F. S. Whitmoyer, J. H. Collins, J. B. Snyder, L. W. Waltzer and B. F. Mickley of Harrisburg and F. G. Paul of Mt. Holly Springs. J. B. Snyder is the treasurer of the company. Plant will beat Mt. Holly Springs.



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One second-hand Hercules Special Brick Machine, manufactured by Horton Mfg. Co. Capacity 30 to 40 thousand per day. Machine in first-class condition. Located in central Pennsylvania. Address

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20,000 fine pallets. $30.00 per thousand, F. O. B. cars here.

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For sale, reasonable, in condition—
One 5x18 foot Horizontal Tubular Boiler.
One No. 20A Penfield Hollow Brick Machine.
One 14 foot Pug Mill.
One Disintegrator,
One 40 foot Clay Conveyor, with 20 foot belt.
Forty Fire-proofing Dies, with two extensions, pullys, clutches and belting.
Reasons for sale, are making different ware.

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For sale—An up to-date brickyard, land and all machinery, at Buchanan, Mich , on the Michigan Central Railway. Can be run by steam or electricity. Owing to the fact that it is owned by a woman who is unable to run it, it can be sold at a bargain.

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Also 55 flat cars for soft mud brick, with foot pallets Track gauge 25 inches.
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One Conical Smooth Roll Crusher No. 25, Style "F," manufactured by American Clay Machinery Co., Bucyrus, O. One No. 5 board delivery side-cut Brick Table. This table has never been used. For information, write

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Wanted—A copy of Brick, Tile and Terra Cotta, by Davis. Must be in good condition. State price.

BOOK, care Clay Record,
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HERE IS THE REMEDY.

PRECIPITATED

Carbonate K.B. C.F.H. **of Barytes**

The only preventative for scum and discoloration on facing Brick and Terra Cotta; neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

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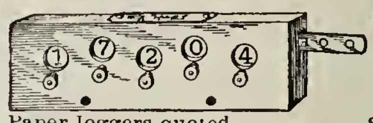

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Guaranteed.
Sold by all dealers.

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A second-hand three-mold Andrus Press, in good condition. Prefer only Andrus type, as I am already using one on my yard. In naming price give length of time used and present condition.

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A sorter and shader to handle light and mottled face brick. Address, with full information as to experience, reference and wages expected.

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FOR SALE.

Drain Tile and Brick Plant for sale Good machinery. Good location. Plenty of clay. Price $2300, small payment down, long time on rest. Wil take product as pay. Address

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Engine for sale—One 14x18 inch 80-horse power Frost Engine. Only used a short time.

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FOR SALE.

Two 4-mold style "F" American Clay Machinery Co. Dry Presses, in good order. Have made about one million brick. Reason for selling is that clay is not suitable for dry press brick. A bargain for some one.

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FOR SALE.

Three 72 Chamber Presses, with rubber gaskets and sacks
One Vertical Double Belt Clay Pump.
Two Steam Clay Pumps.
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All the above machinery used only a short time, and is as good as new. Address

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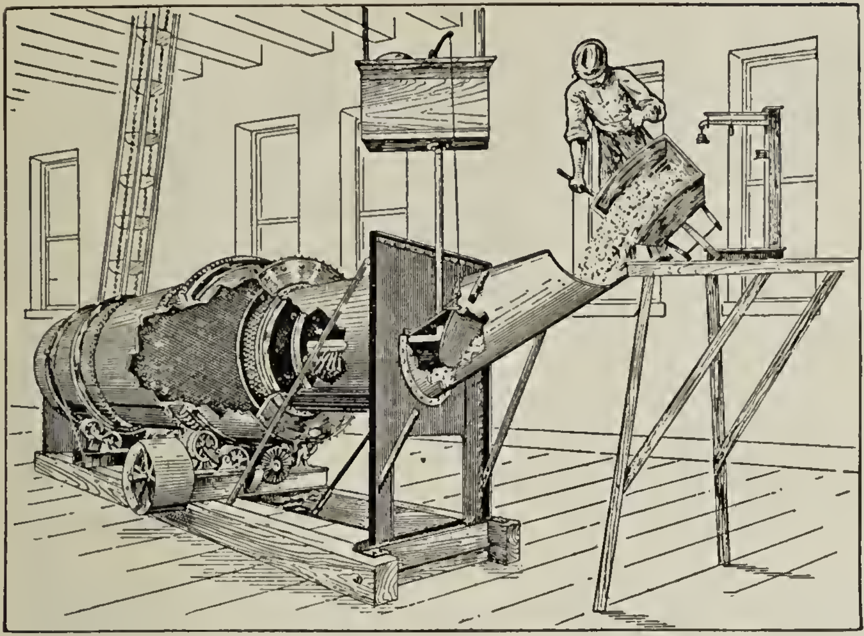

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The capacity from one to ten tons per hour, depending upon size of machine.

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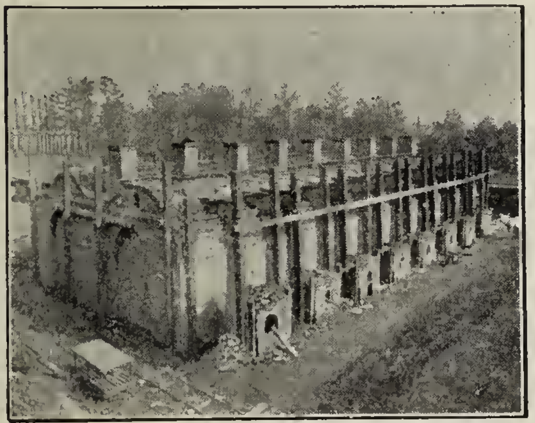

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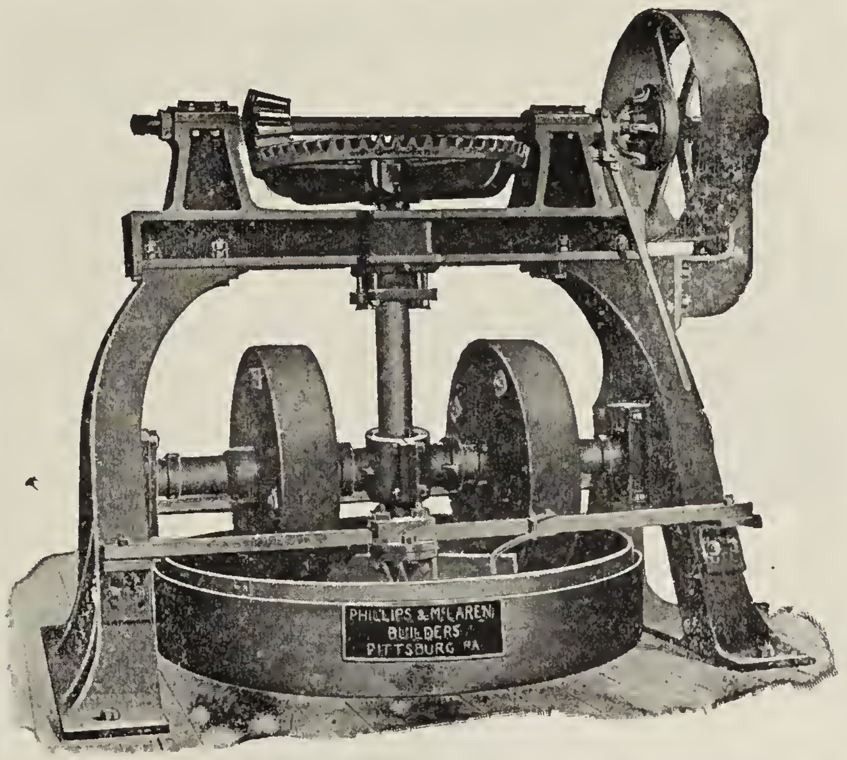

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Tell us kind of material and capacity you have and we will quote you accordingly.

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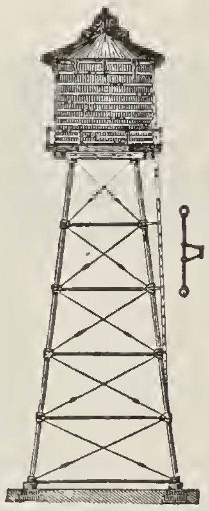

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Brick Moulds and Brick Barrows

With Moulds and Barrows it is not the first cost, but it is, will **they last?** We have made them for over 30 years and know your wants. All kinds and shapes. A trial order will convince.

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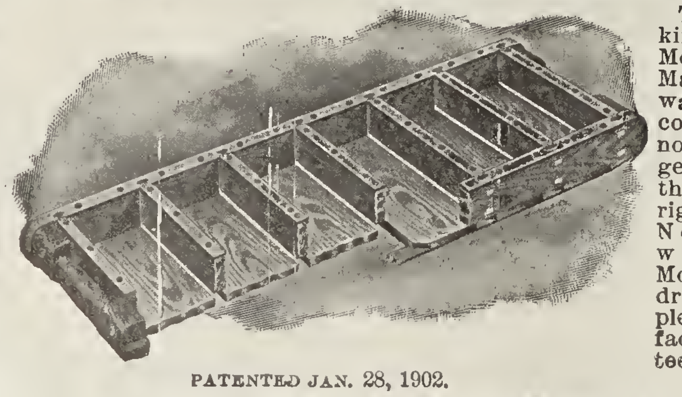

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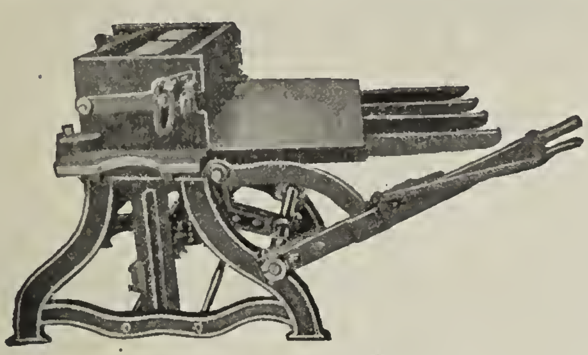
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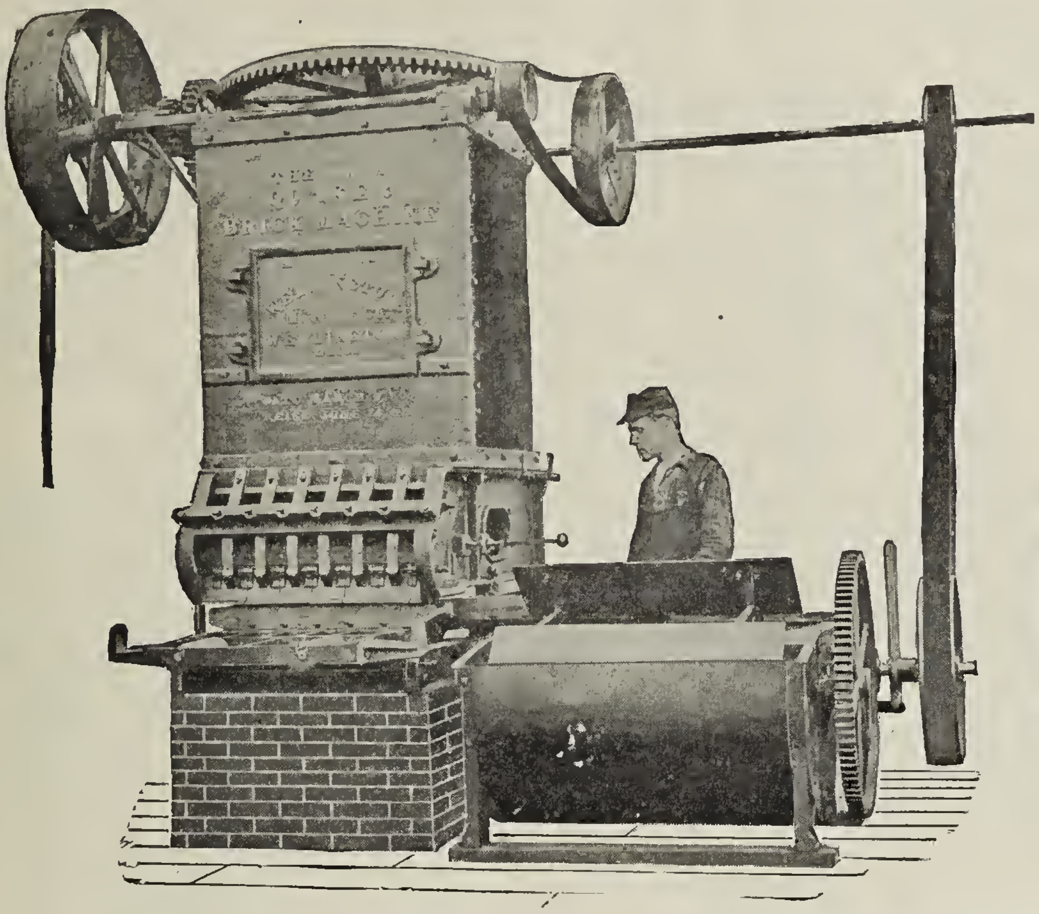

Over 500 "Quakers" in use, both Horse and Steam Power, now made entirely of Iron and Steel. I have the best, simplest and cheapest Mould Sanding Machine on the market. With my Roller-Bearing Brick Barrows you can wheel 15 per cent. more brick and do it as easily. Order one subject to approval.

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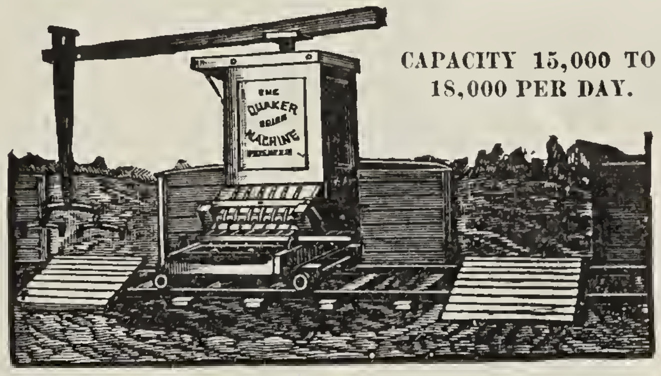

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The **NEW IRON HORSE-POWER QUAKER** is indeed a model machine; it is the best machine for equipping small yards at a moderate expense that has ever been put upon the market. It is built for the attachment of steam gearing whenever desired.

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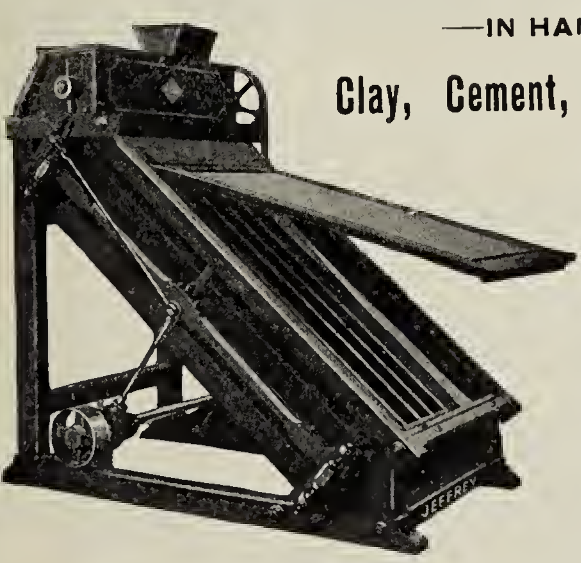

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Add a Stone Factory to Your Brick Plant?

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No carrying off blocks, consequently no loss by breakage, no expensive iron pallets, no cogs, gears, springs or levers, but it does the business

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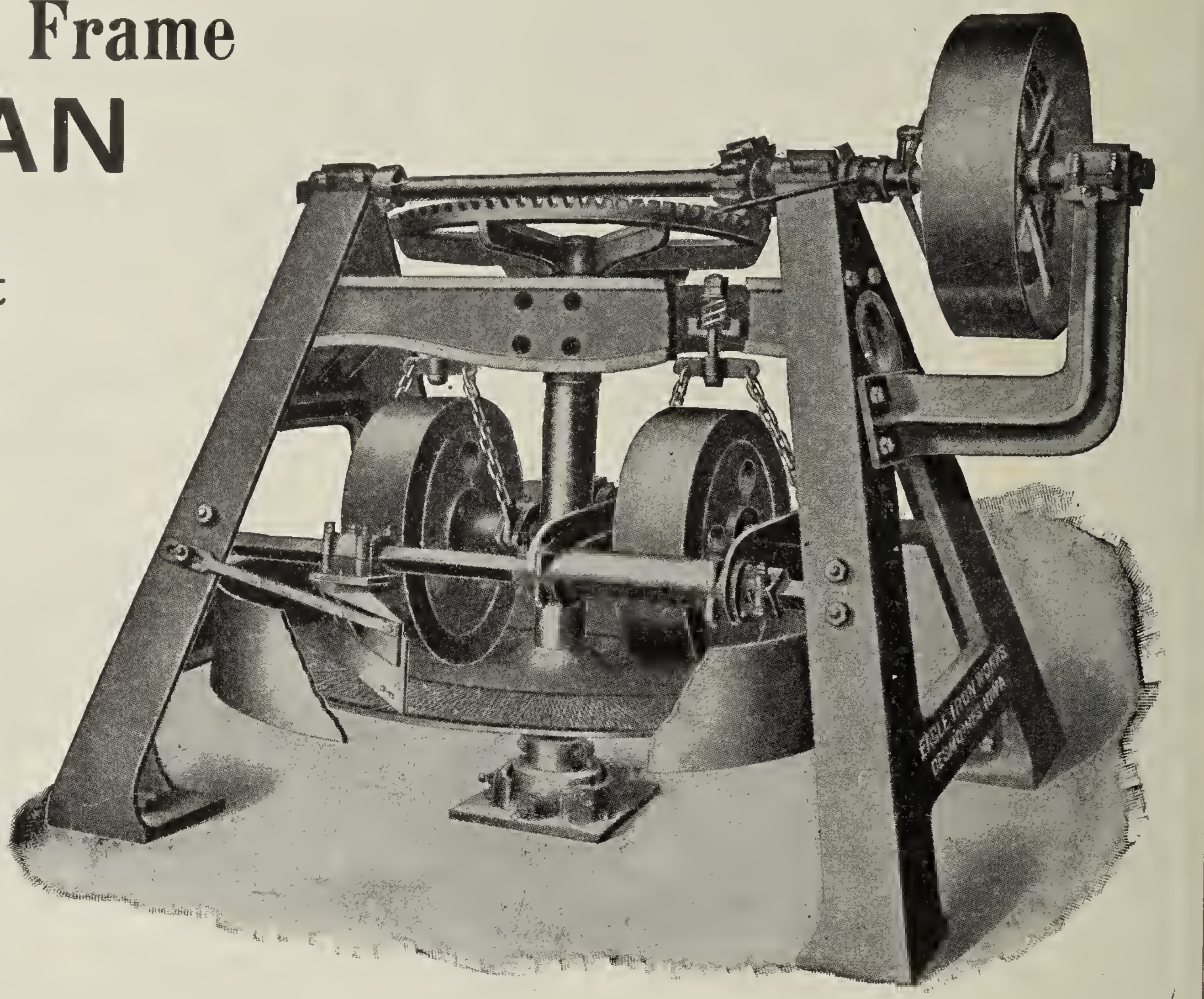

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BRICK MADE ON OUR SAMSON PRESSES.

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Send for information. We have equipped plants in all parts of the United States. We do not use cement or chemicals, and do not sell patent rights.

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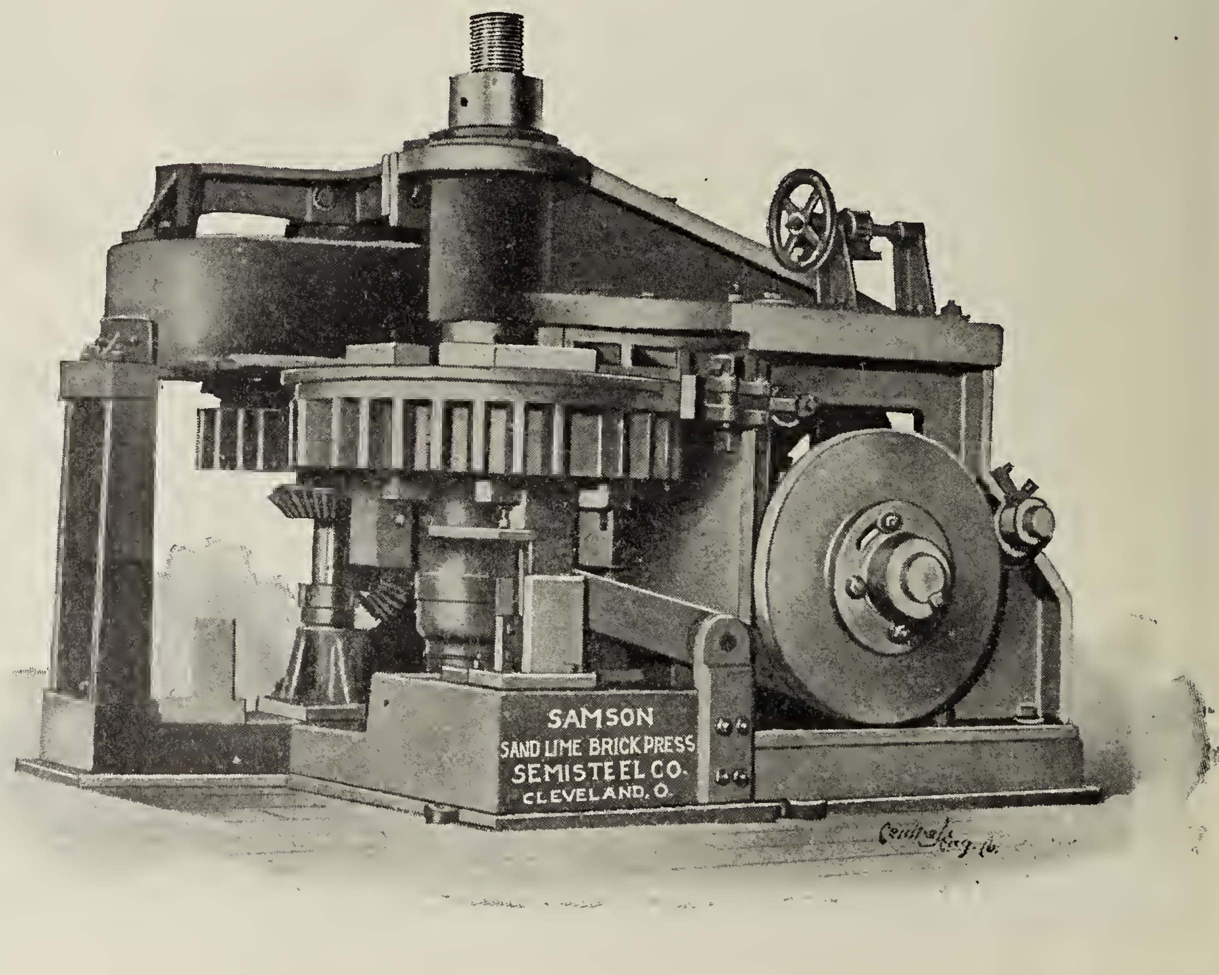

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25 Factories Designed, Equipped and Set in Operation During the Past Year in the United States and Canada.

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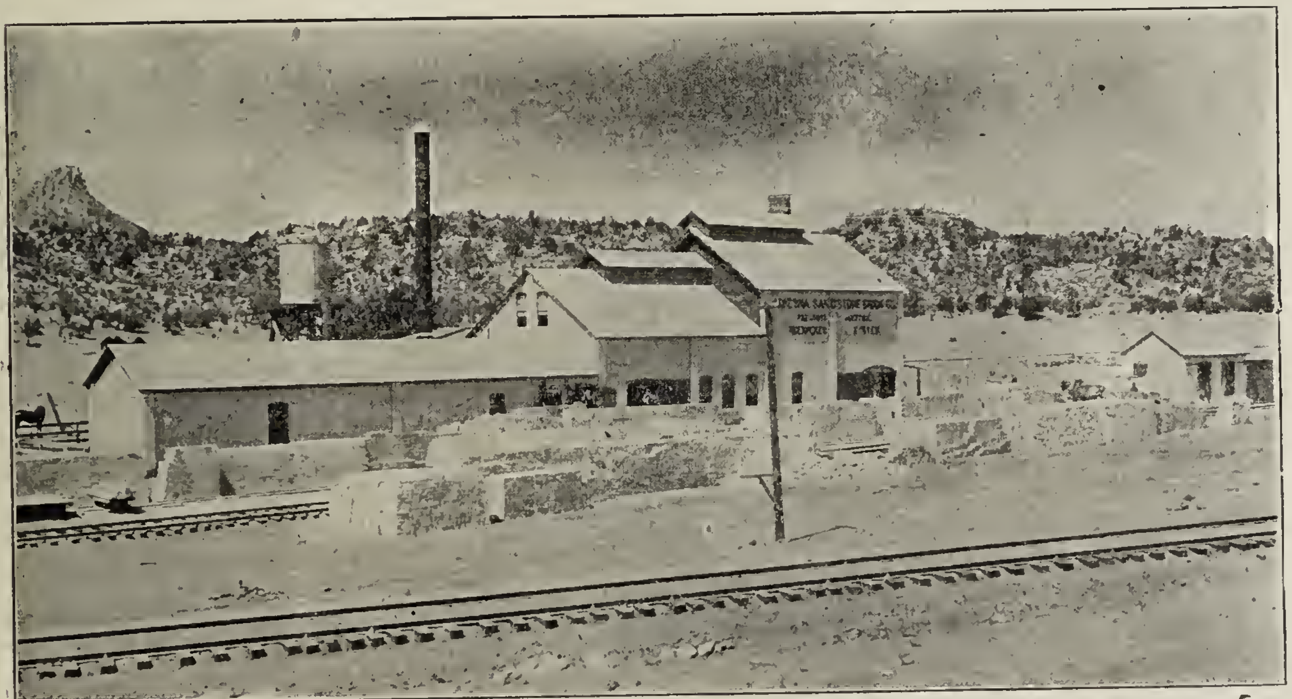

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"THINK THIS OVER."

Before the expiration of this year the total combined capacity of the factories erected and operated under the "Huennekes System" will be about 300 million bricks per annum—or a growth of about 2,000 per cent in one year.

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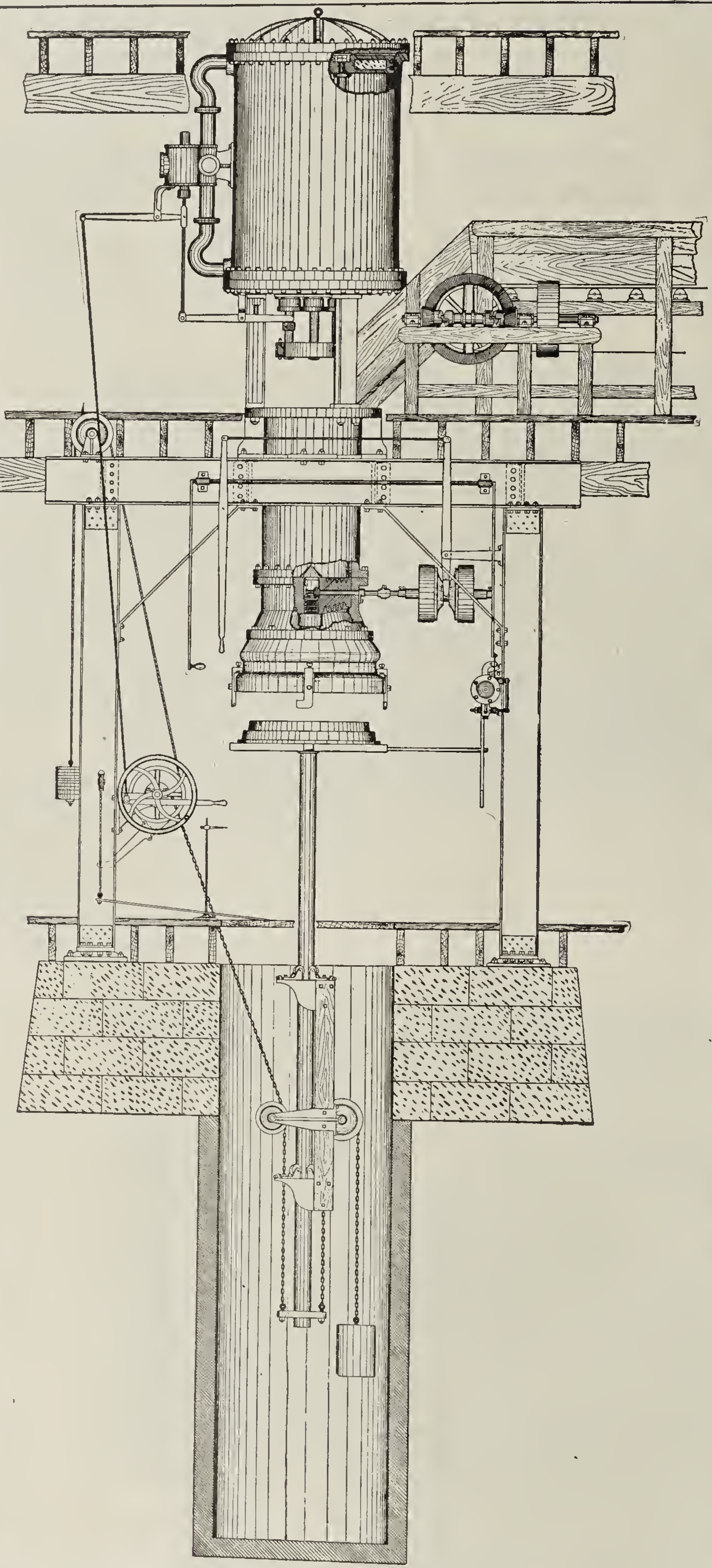

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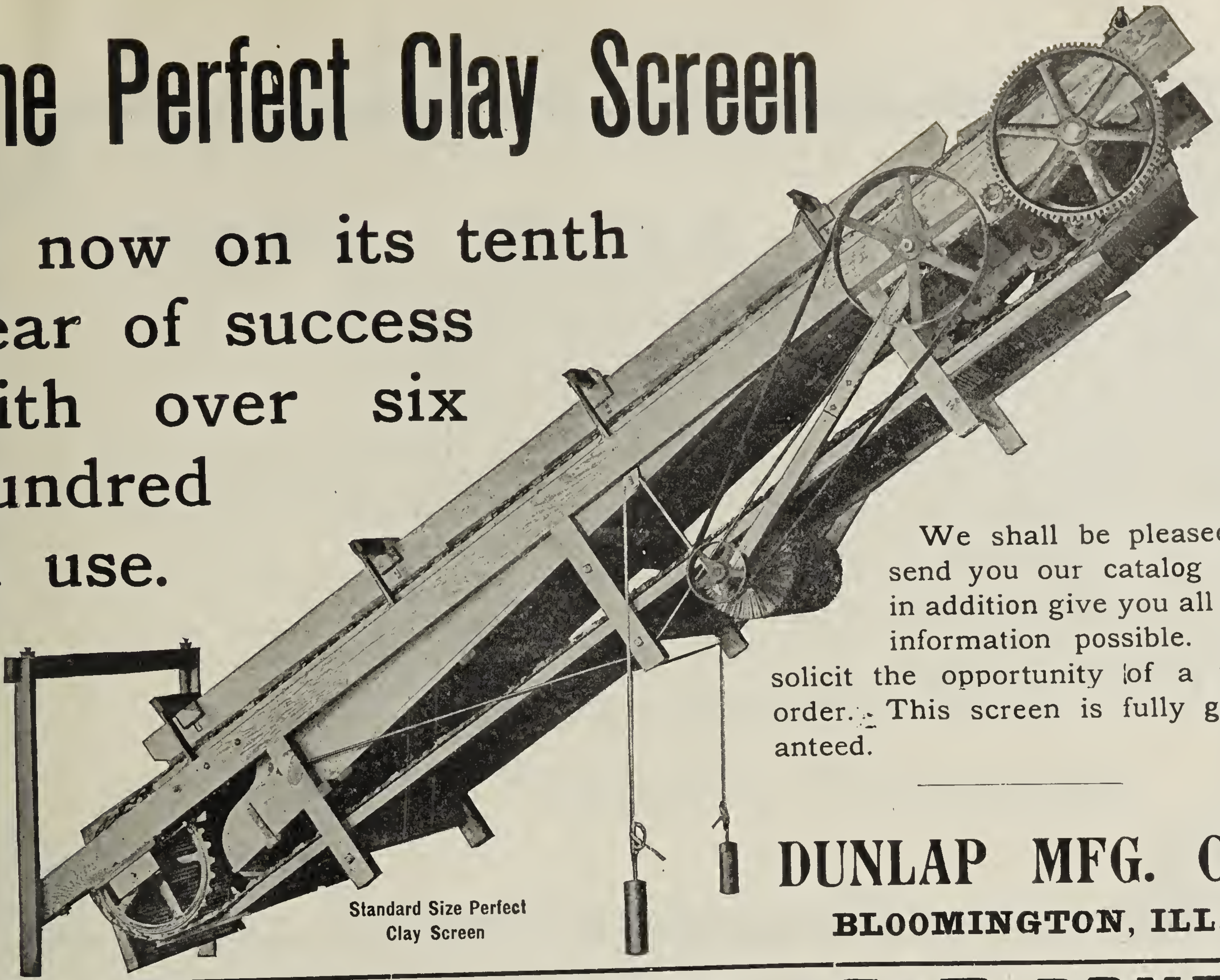

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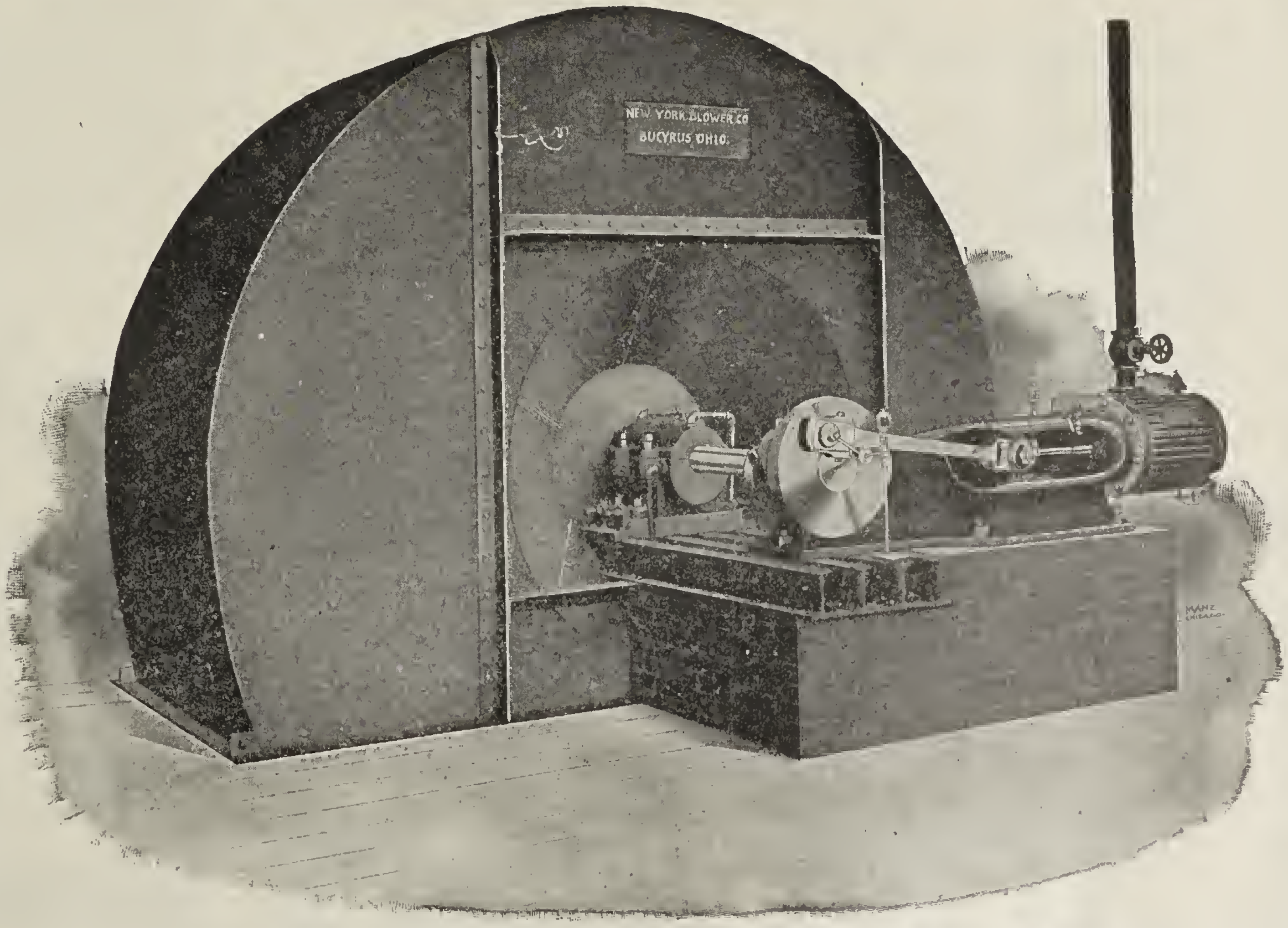

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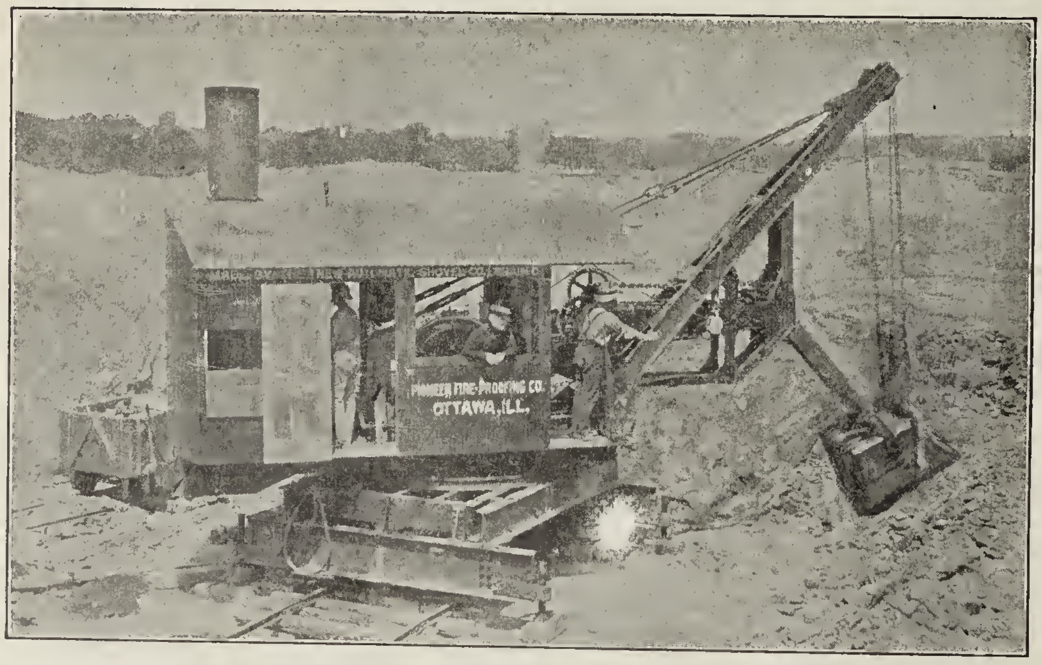

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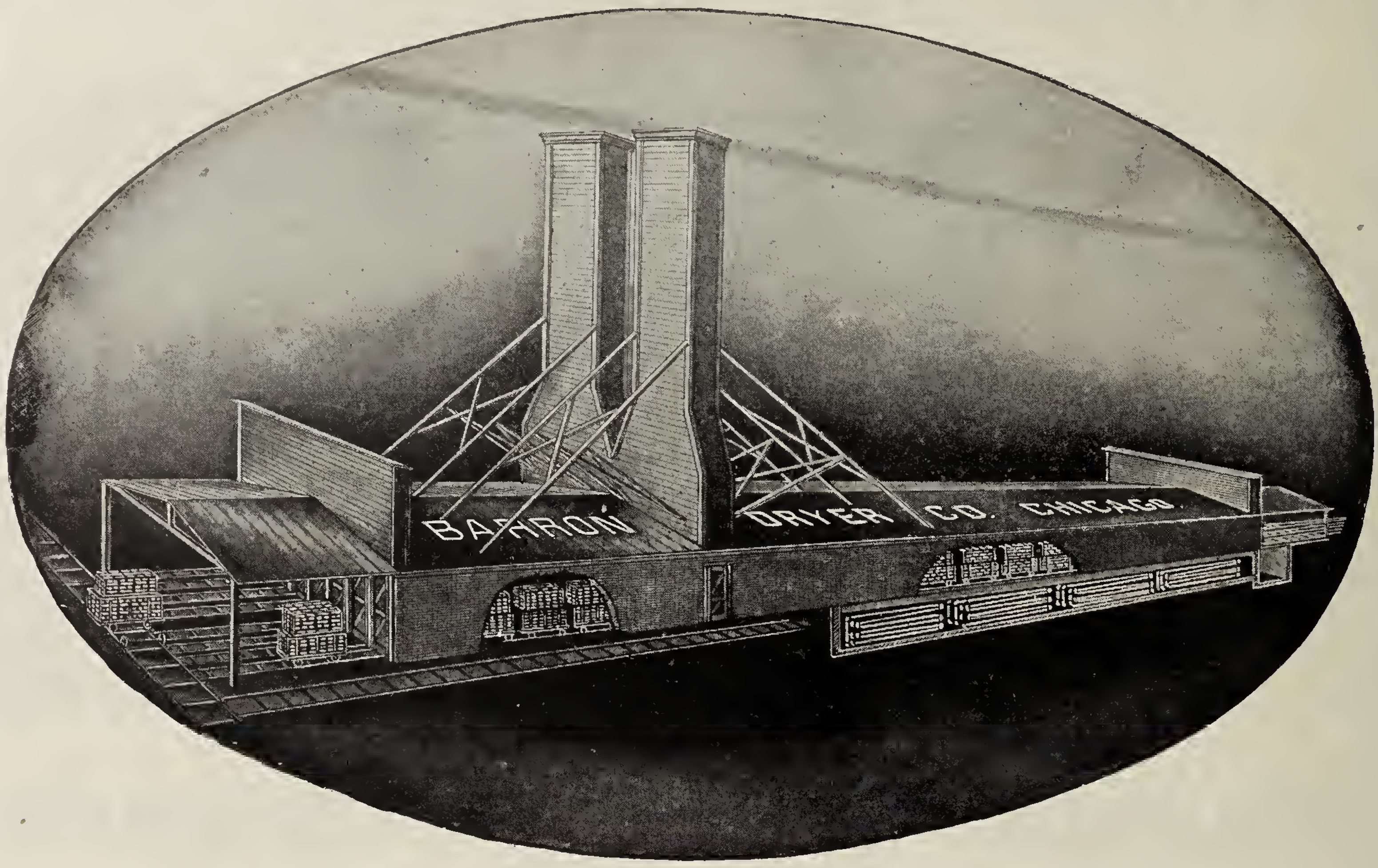
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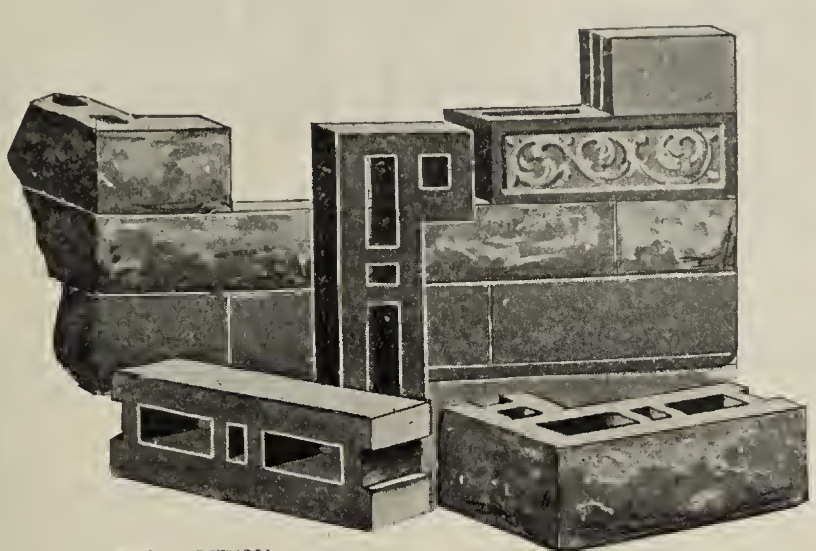

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It makes all lengths from **four** to **thirty-two** inches.

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It makes all angles for **bay-windows.**

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It was invented by a **practical** builder who knew what was necessary.

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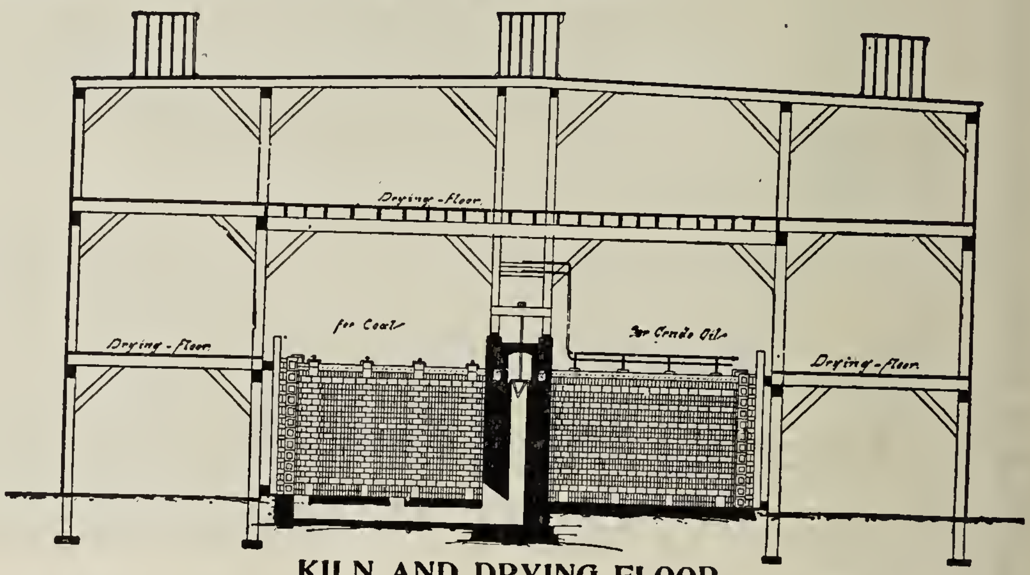

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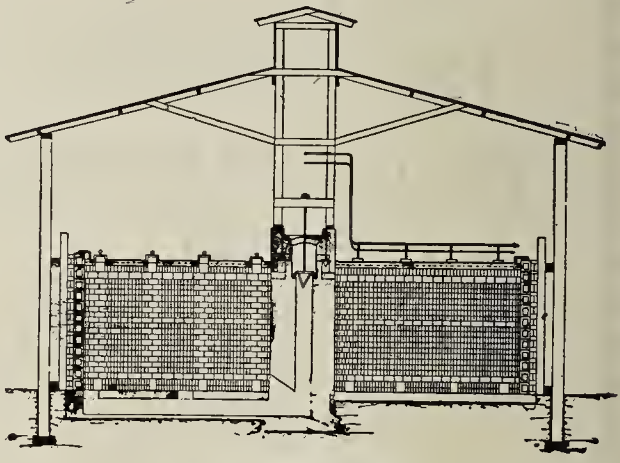

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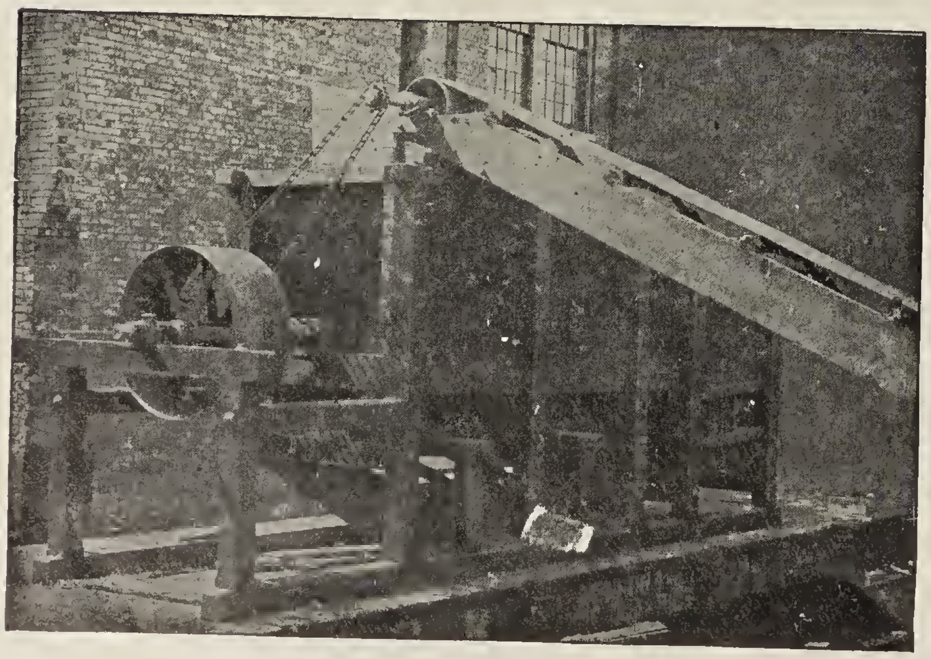

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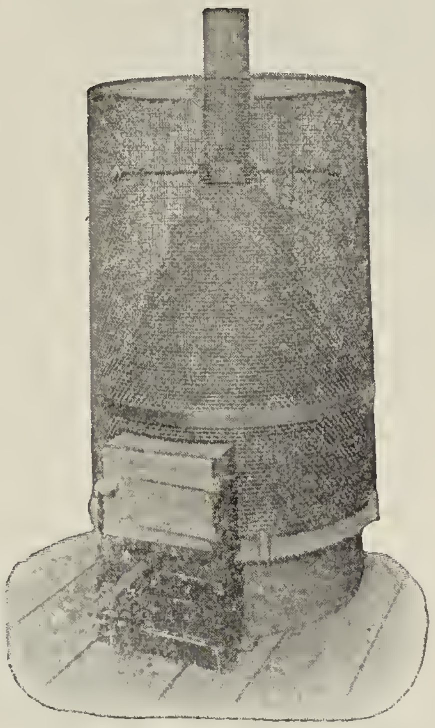

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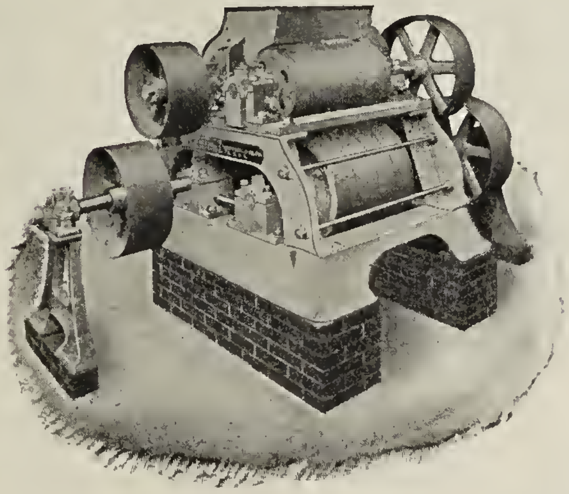

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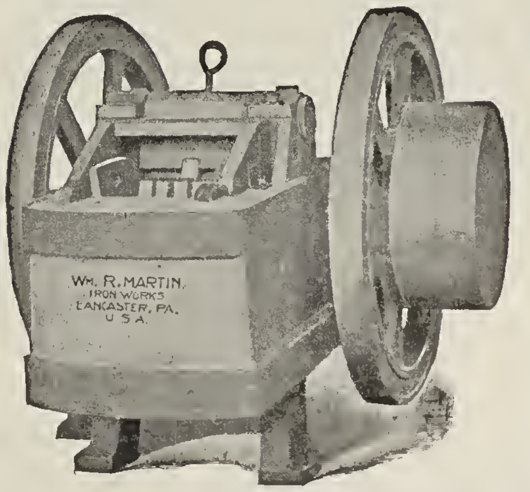

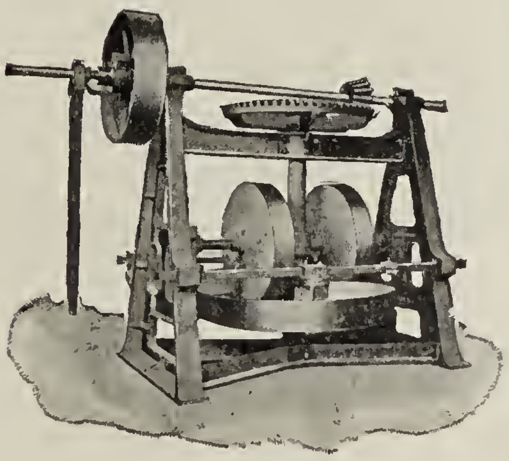

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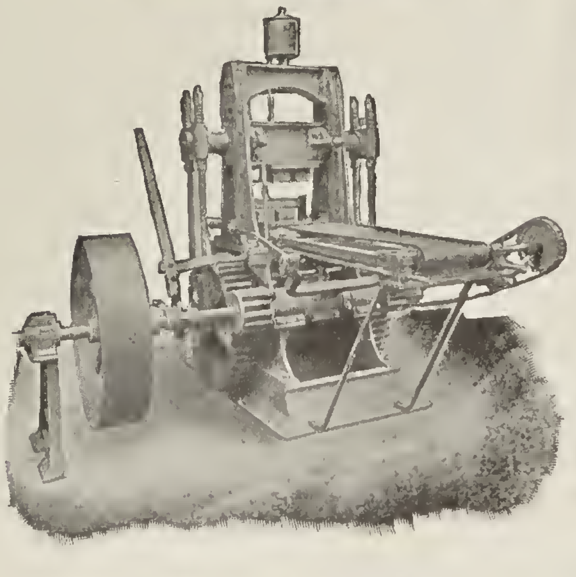

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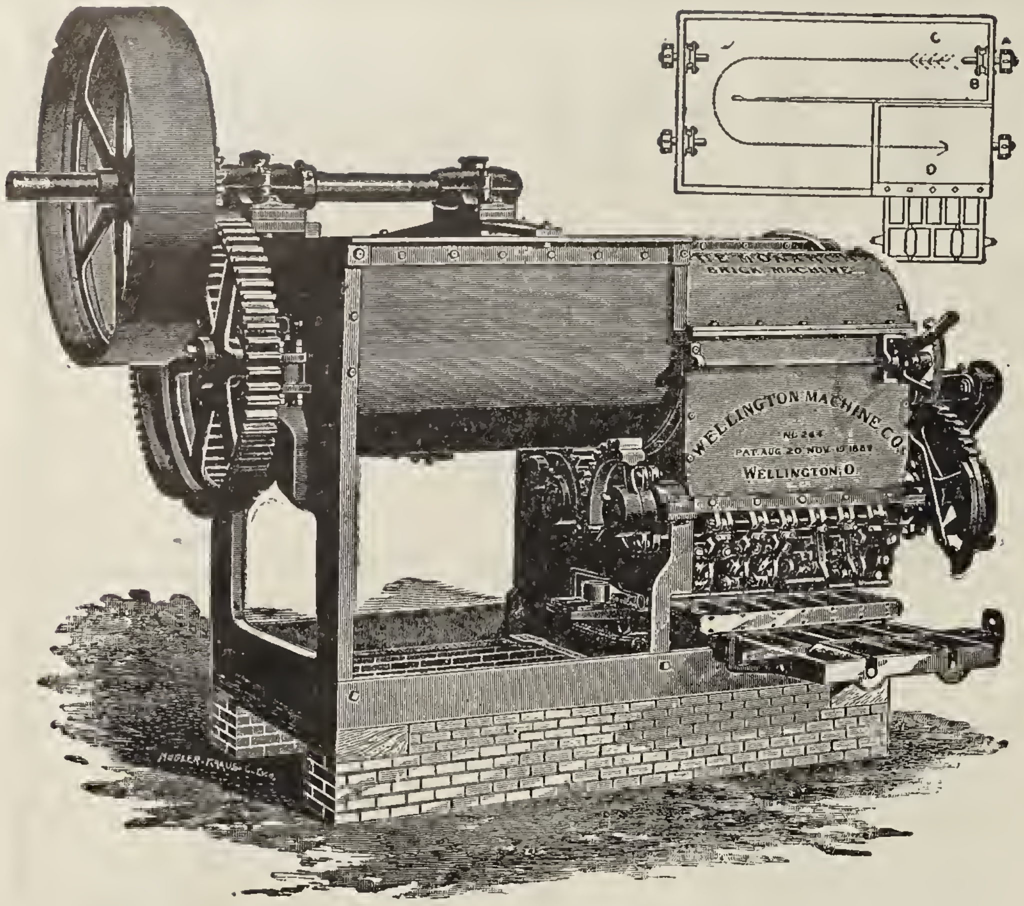

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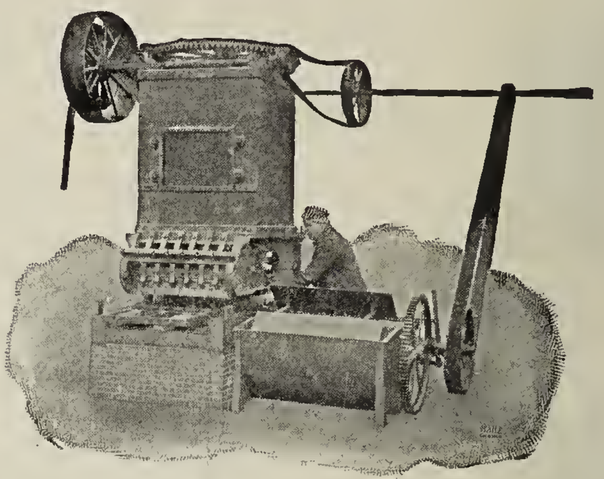

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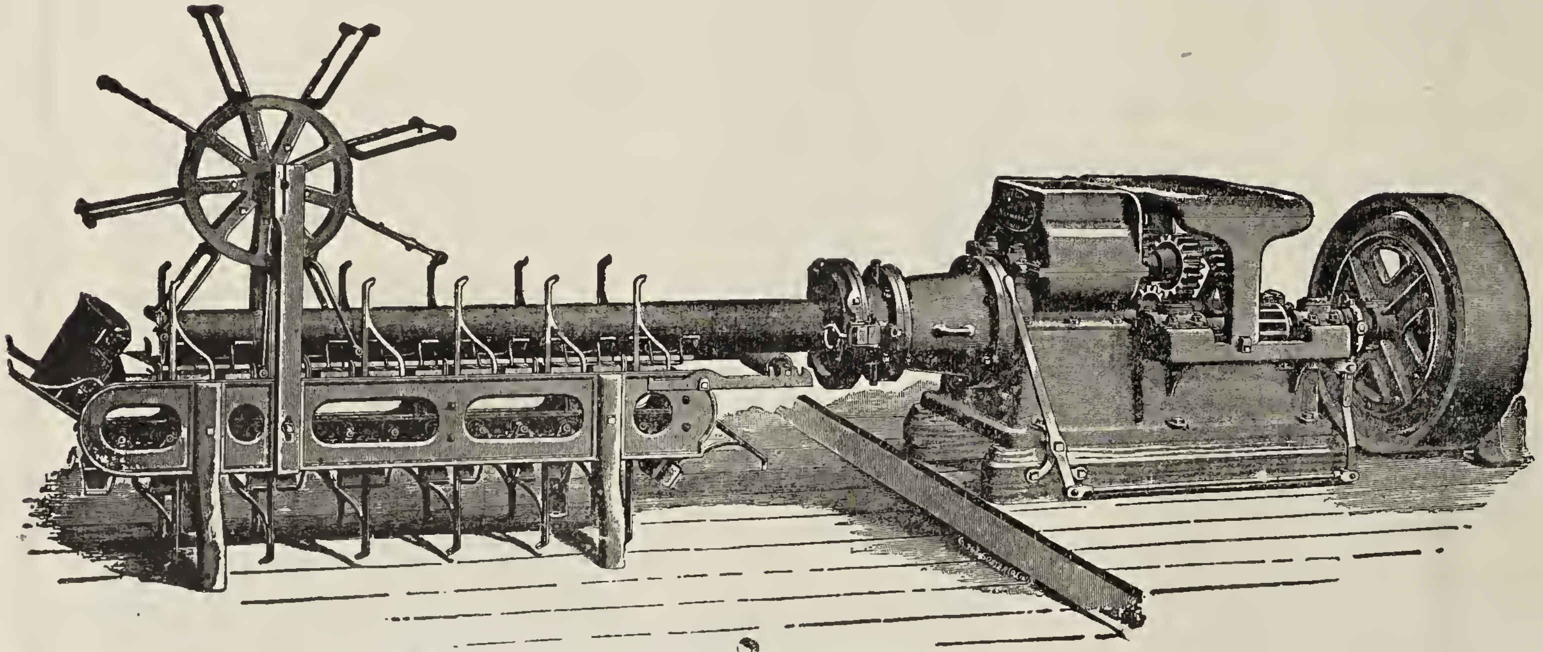

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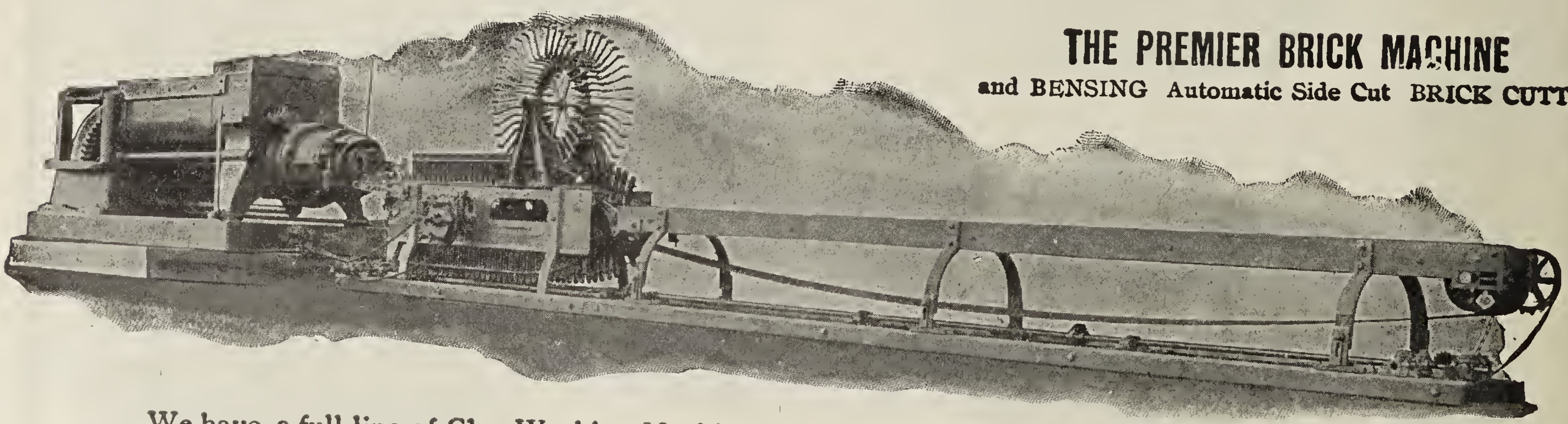

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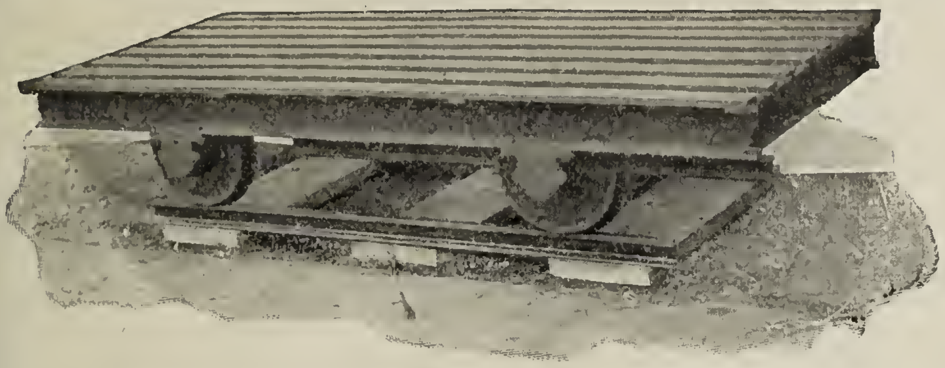

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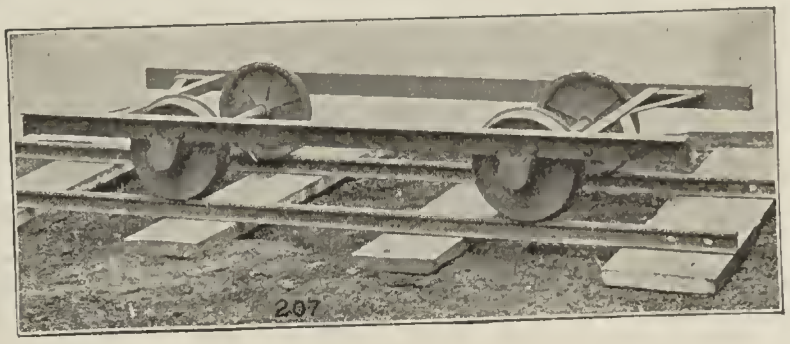

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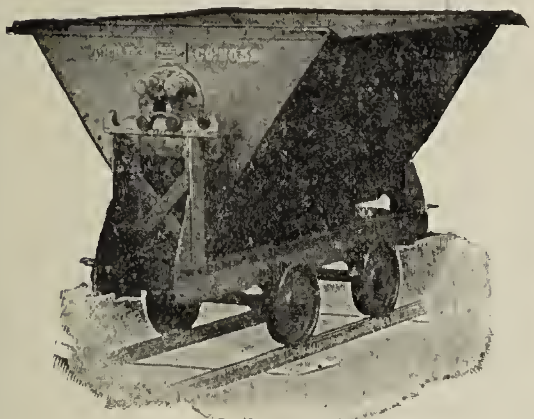

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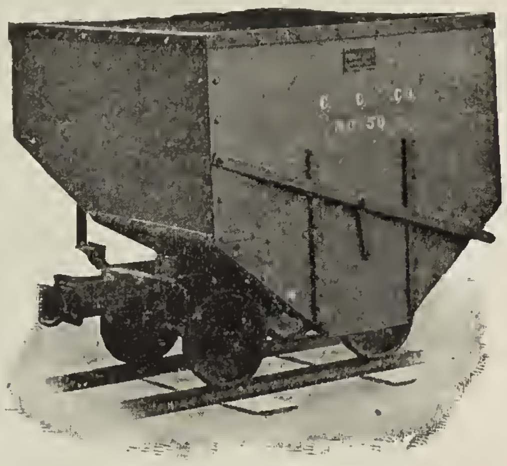

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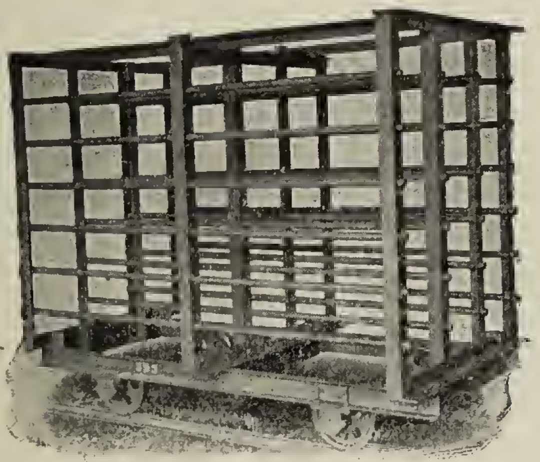

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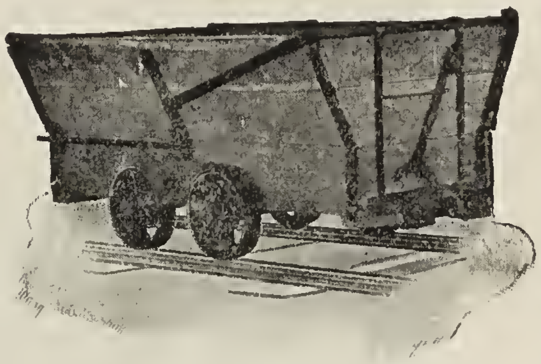

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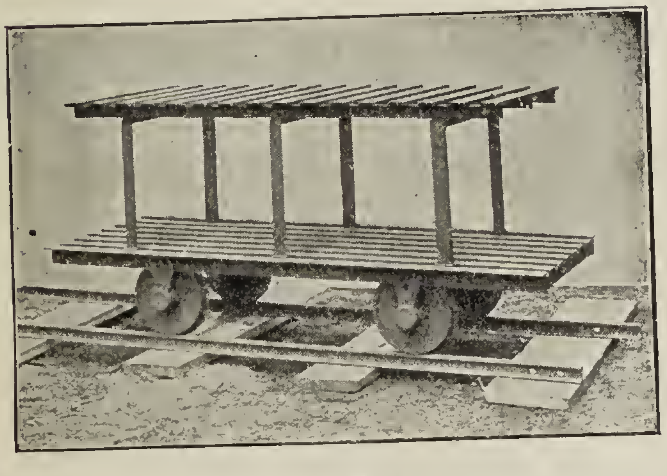

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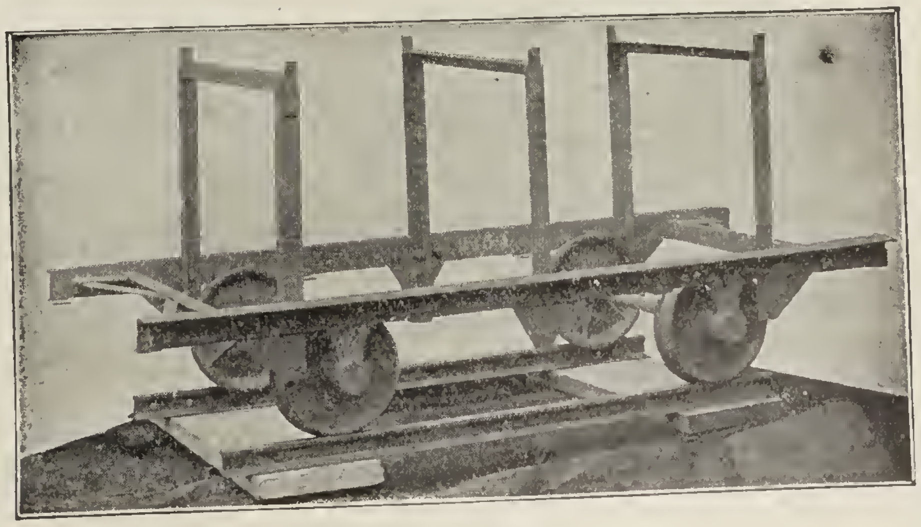

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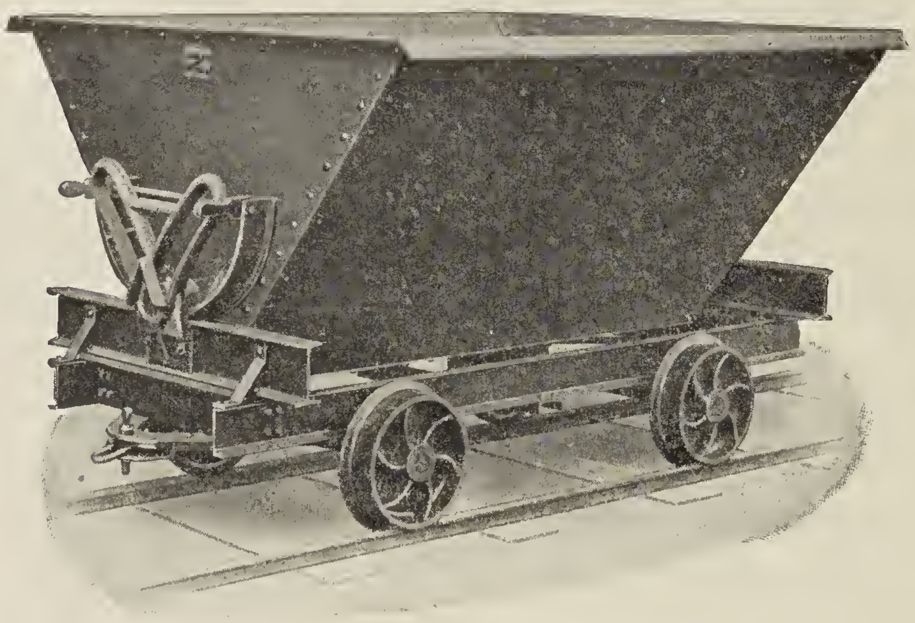
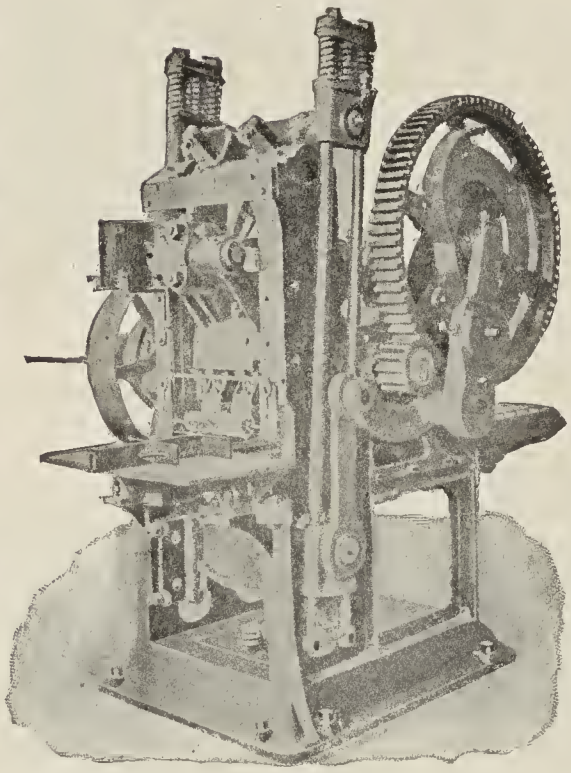


Clay Car.

If not, we can send some which we guarantee will be. They have no chains or pins to get lost or broken, cars cannot overdump, are self-locking, self-centering, easy running and durable.

We also build dryer cars of all kinds for all purposes.



Richardson Double Die Repress.

The Richardson Repress has all the features of merit that are demanded of a machine of this kind. Has enough depth of mold to make the largest size paving brick. All the working parts are above dies out of the way of waste clay. It has a slow pressing movement with double pressure, bringing out distinctly all markings and lettering. The working parts are adjustible to wear. It requires very little power and costs little to keep in repair.

Kindly write us for catalogs and full information.

The Ohio Ceramic Engineering Company

50-56 Fall Street, Cleveland, Ohio.